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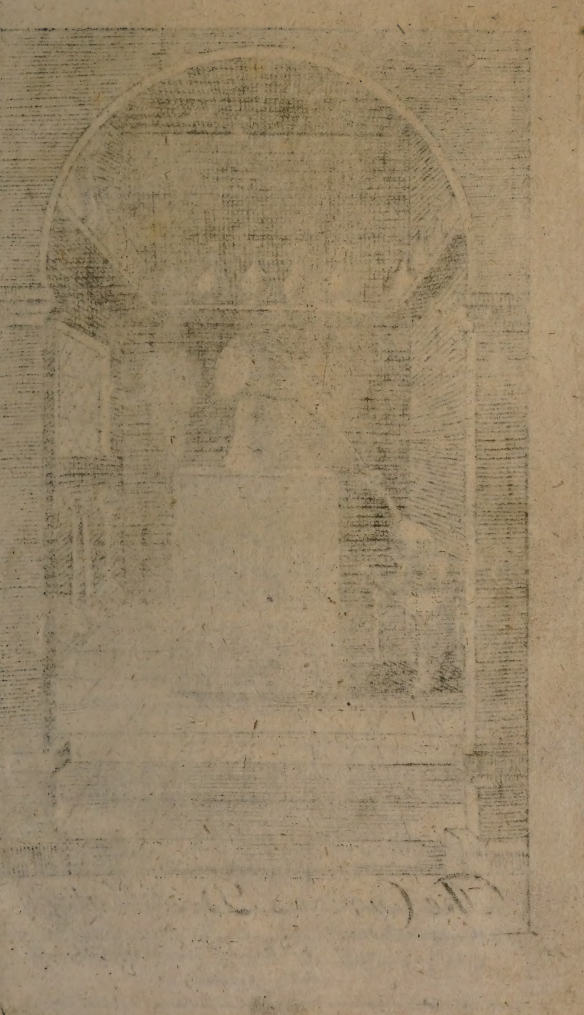
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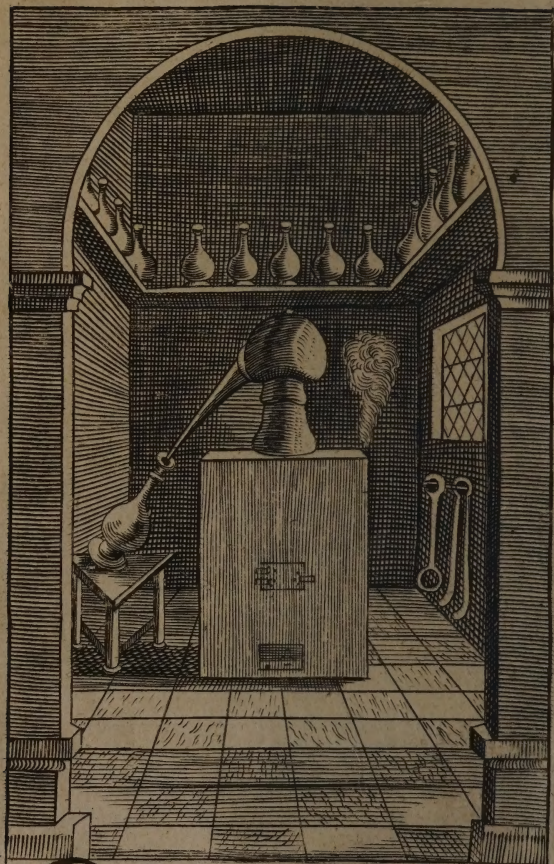
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The Curious Destillatory.

Tho. Cross sculpit.

T H E

Curious Distillatory:

Elizabeth OR *Jones*

The Art of Distilling Coloured
Liquors, Spirits, Oyls,
&c. from *Vegitables, Animals,*
Minerals, and Metals.

A Thing hitherto known by few.

Containing many Experiments easy to perform, yet Curious, surprizing, and useful: relating to the production of Colours, Consistence, and Heat, in divers Bodies which are Colourless, Fluid, and Cold.

Together with several Experiments upon the Blood (and its *Serum*) of Diseased Persons, with divers other Collateral Experiments.

Written Originally in *Latin* by *Jo. Sigis. Elsholt.*
Put into *English*

By *T. S. M. D.* Physician in Ordinary to
his Majesty.

London, Printed by *J. D.* for *Robert Boulter*, at the
Turks-head, over against the Royal-Exchange
in *Cornhil*, 1677.

Chemical History

Vol. 1

25

The Art of Dyeing

by J. H. P. de la Roche

Translated from the French

by J. H. P. de la Roche

London, Printed by J. H. P. de la Roche

Containing many Experiments

on the Properties of Colours

and the Production of Colours

in Glass Bodies which

are Coloured by Heat and Cold

Together with several Experiments upon the

Use of Colours in the Arts

and the Production of Colours

in Glass Bodies which

are Coloured by Heat and Cold

Together with several Experiments upon the



TO THE
Right Honourable
PHILIP,

Earl of *Chesterfield*,
Lord *Stanhope* of *Shel-*
ford, &c.

My Lord,

IN the Eastern parts
of the World, no
Man approaches a
Great, an Illustri-
ous Person, without
a Present: And in these Western
parts it hath been for many

A 3

Ages

The Epistle Dedicatory.

Ages a Custome, (and still remains so) to dedicate Books of *Curious* and Polite Learning, to Eminent, and Worthy Men. And this for several Reasons : for by prefixing before the Books they publish the Names of those Excellent Men to whom they are obliged for former benefits, They do thereby in some measure express their Gratitude : As also by that means their works are better Adorned; and thus receiving Splendor from their Patrons Glory, they thereby gain the better acceptation in the World. Some propose the writing of *Panegyricks* in Honour of their Patrons. But that

The Epistle Dedicatory.

that looking so like Flattery, I willingly avoid. Besides, it were madness to suppose, your Lordships *Masculine Virtues* both of *Mind*, and *Body*; As your *Courage*, *Generosity*, *Singular Prudence*, *Equity*, *Candor*, *Affability*, *Compassion* to the Afflicted, &c. can possibly be described, or comprized, within the Limits of an Epistle: Nor need I attempt the doing this, since your Lordships truly Noble Qualities, are so Eminently known to the whole Nation.

I Address this Book to your Lordship, not for any of the foregoing Arguments, but chiefly for the following Cause.

The Epistle Deditatory.

The Art by which the Experiments produced in these Papers are made, (*viz. Chymistry*) hath in all Ages been imbraced, and cultivated by both the Learned *Magi* and *Kings*, and is at this day much prized, and Practised by many of the *Princes of Germany*: And highly esteemed and promoted by the Example of our own *Sovereign's* delighting in it, and favouring of it. And it must be granted that the *Antients* could not bestow so much Honour upon it, as it hath gained (in this our time) by obtaining your Lordships Favour. For you have added new *Rays* to Illustrate it,

The Epistle Dedicatory.

it, by your Studying and Practising of it.

My Lord, Having mentioned this, I have shewed the cause why I presume to make you this Present : The Treatise it self being of that *Art*, whereof your Lordship is so great a Master ; And therefore I hope the Argument will not be ungrateful. The Original Author is sufficiently known (abroad) to be both a Learned, and Practically knowing Man, and he thought this piece worth the presenting to a whole Society of Men, that are likewise such themselves ; I mean the *German Academy* of the *CURIOSI*. It hath also the Applause of many

The Epistle Dedicatory

many of our ingenious *Vertu-*
osi of the *Royal Society*: These
Reasons have encouraged me to
put it into *English*: And to de-
posite it at your Feet. Desire-
ing your Lordships acceptation
of it, as a Testimony of Vene-
ration, And the Eternal de-
voting of my Self,

Your Lordships

From my Study
London, this
4th of April,
1677.

Most Humble,

Affectionate

and

Faithful Servant,

Tho. Sherley.

To the Reader.

READER,

Good Wine needs no Bush; Nor
Good Books Commendatory Epi-
stles: And yet as the Vintner will
hang out his Garland to draw in Cu-
stomers to his House, So also the Book-
seller thinks himself obliged both in
interest to himself, and Civility to
Thee, to put out this Sign to acquaint
Thee with the quality of the Ware he
here exposeth to Sale.

Know then, this Treatise consists of
many Curious Experiments, which both
upon the account of their variety, use-
fulness, singularity, and ease in per-
forming them, must needs prove de-
lightful, and consequently acceptable
to him that desireth to improve his
Dominion over the Creatures: which
is only to be acquired by gaining a true
knowledg of their Natures and qua-
lities,

To the Reader.

lities, which can no way be attained so well, and with that certainty, as by making Experiments upon them: of which here are such plenty, and of such different kinds, and those such as will afford such fruitful hints to a considerate Reader, for Analogous Experiments, That I cannot but give this Testimony, That I have not met with a Tract which contains so much, in so little roome, and without Confusion. Add to this, That the Experiments here alledged, are so easily practicable, That a great part of them may be performed in a Chamber, (by such common and cheap means, as are constantly to be had, either at the Druggists, or common Chymists) and do not require a Specious Laboratory, (which is expensive,) nor long attendance (as many Chymical Processes do) which is tedious: And yet these are not of the Nature of Contingent Experiments (which sometimes happen, and sometimes

To the Reader.

times fail, being much varied by slight and unheeded Circumstances:) But they are certain in their event, and seldom subject to Miscariage. If therefore Reader thou art virtuously inclined, and hadst rather spend Thy time innocently, and usefully, than viciously, (not to say Modishly :) Thou maist here be furnished with occasions to do so. And to be serviceable to Thee in this end, was indeed one of the chief Motives which caused me to render this Book into English; the Original being so valued beyond Sea, that it was gratefully accepted there; and those few Copies, which were transmitted hither, were quickly bought up, so that the Book becoming scarce, I thought it a charitable act to Translate it; and thereby preserve it for thy use, and satisfaction, to which intent I commend the perusal of the Tract it self to Thee,
And Remain Thy Friend,

Tho. Sherley.

The

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Mend the *Errata's*, Thus.

P Ag. 2. line 24. read, *they is*. P. 7. l. 6. r. *intencely*. P. 13. l. 26. r. *Particles*. P. 27. l. 13, &c. And P. 50. l. 8. &c. The *Paragrasss* in *High-Dutch* are both misprinted; but the sense being truly rendred in English, the Reader is desired to excuse it. P. 30. l. 5. r. *Alimbecks*. P. 34. l. 15. r. *swiftness* when they are distilled. P. 41. l. 16. r. *Tree*. l. 24. r. *enode*. P. 42. l. 6. r. *assulation*. P. 44. l. 23. r. *Experiments* which follow were &c. P. 46. l. 20. dele by, & r. *Salt is broken, and the Particles are*. l. 22. dele. which were kept under. P. 49. l. 16. dele are. P. 56. l. 5. for which, r. *this*. P. 60. l. 8. for to, r. *doth*. P. 62. l. 15. for but, r. *more then*. P. 66. l. 20. r. or of an *Orient*. P. 75. l. 26. r. *well*. P. 83. l. 1. dele now. P. 84. l. 2. r. *ounce*. l. 7. r. *late it*. P. 97. l. 14. r. *Illustration*. P. 98. l. 1. r. *Experienced Sir*. P. 104. l. ult. r. *Menzelius*. P. 107. l. 18. r. contained in it. P. 108. l. 5. r. and under the form of.



The curious Distillatory;

O R

The manner of drawing colour'd Liquors by an *Alimbeck*, which thing if it hath not been altogether unknown, yet hath been hitherto observed, and noted by very few.

CHAP. I.

The occasion of writing.

THe *English Philosophical Transactions* have now a long time been published, and are grown into *Volumes*; also the *French Diary*, doth consist of and hath compleated five *Tomes*: And likewise the *German Academy* is now employed in putting forth their fourth *Volume*:

B lume :

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lume: so great every where at this day hath been their studious labour, and so great is the *Æmulation*, and struggling of the most flourishing Nations betwixt themselves: that every one of them do seem to hope in a small time to vanquish and triumph over *Nature*. Truly it is a most Noble Employment, and such an one as former Ages hath been unacquainted with: to which if there shall be added, the greater Munificence of *Kings*, and *Princes*, there is no doubt left, but that at last from thence, there will redound great Advantage to the Publick.

All of these are imployed about new Inventions, and observations, in the *Mathematicks*, in Natural Knowledge, or *Philosophy*, in *Anatomy*, in *Chirurgery*, in *Medicine* in General, also in the Books of *Politicks*, *Histories*, and other Books lately Printed to adjudge, and revive them. Also they have mixed many things which particularly belong to the *Chymical Art*: but they if compared with the rest are but few: although from thence a more plentiful crop might certainly be expected, than from any of the other Sciences.

Upon this very occasion, I evolving those kind of writings, it came into my
mind

The curius Distillatory. 3

mind that perhaps it were convenient, that those most excellent *Academical* men, were by some publick admonition excited to bestow more pains for the future upon that *Art*, in whose deep Well lies hid an infinite plenty of *Arcana's*, or secrets. To this intent therefore we have written this Book, and Intituled it *Destillatoria Curiosa*; I say *Curiosa*, for neither is it such, that it should be extold by us with high Encomiums, nor can it promise of it self very great advantages, or utility, but this praise is sufficient for it, if by occasion of it, a *Spur* shall be added to men of sublime ingenuity, and expert *Artists*, that thereby they may not only find out the like experiments, but having found them out, communicate them without envy.

CHAP. II.

*Of Colour, and of the Appearances of
various Colours,*

EXactly to teach the Nature of Colour, is as hard as to explain the true reason of Light, of it self most clear: *Jul. C. Scalliger, Exert. 325. Sect. 1.* Rightly says, *The Causes, and Essence of Colours are as full of controversy, and obscurity to the Intellect as they are manifest to the sight.* Aristotle *Lib. de sensu, & sensit. cap. 3.* Defines Colour, that it is *perspicui terminante extremitas*: *The extremity of a terminated body that may be seen, or seen through.* Neither more clear is the description of others, *That it is a quality of a coloured Body.* Also that it is *modified Light.* Many of the Chymists do attribute all Colours to their principle of Sulphur, others of them to Mercury: of which opinion what is to be thought, it is very well worth the reading of *Dan. Sennertus, lib. de consensu, Cap. 11.* Excellent also is what hath been delivered upon this Argument by *Antonius Scarmilionius Fulginas,* and
Mr.

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Mr. Boyle in his Book of Colours. See also upon this subject, *Petrus Maria Capenarius lib. de Atrimentis*, and *Johan. Christoph. Kolhansius Tract. Optic.* and others.

But these controversies not properly belonging to our design, leaving them, we will rather note the differences of Colours; yet not all of them, since they are many; (and already amongst others) they have been sufficiently and subtilly explained by *Scaliger. Exercit. 325. Sect. 6. and in the following*: we will only touch upon and handle slightly such of them now, as will lead us the shortest way to our prefixed end.

For the material subject of Colours we distinguish them into those which are real, or true, and into such as are *Emphatick*, and Apparent, or seeming. A *Specimen*, or example of these is afforded by the *Rain-bow*, a *Prismatick* or Triangular Glass, the redness of Wine spilt upon a Napkin. These we divide again into *Penetrative Colours*, such as *Obryz*, or pure *Gold*, and *Sealing Wax*: and into such as are *Superficial*, of which sort are *Apples* appearing outwardly red, and yet are inwardly white.

Moreover Colours considered in the ab-

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fract are either *Primitive*, or *Simple*; to wit, *White*, *Yellow*, *Green*, *Blew*, *Red*, *Black*; I say considered in *Abstracto*, or as they are to be distributed into certain, and distinct *Clauses*: for otherways *Green* seems rather to be composed of *Yellow* and *Blew*, whether it be made of *Vegetables*, or *Minerals*. So *Auripigmentum*, or *Orpiment* if mixed with *Indigo*; or *Gum of Peru* cemented with *Cobalt*, or *Bergblau*, as the *Germans* call it, supposed to be the Native *Cadmia*, or *Copper-Stone*: or mix *Ultra Marine* with *Saffron* and you shall see a *Green Colour* will proceed from these mixtures.

Or else they are divided into *compound Colours* made from the mixture of *simple* ones: or else they are *decompositi*, or doubly compounded, which are made again in infinite variety by the mixture of compounded ones among themselves, as may be seen upon the *Palates* of *Painters*: but if you go to the *Laboratories* of *Chymists*, there you will be supplied with a reason very different from these, by which *Colours* may be so changed, (and that with a most delightful variety to behold) that adding what is necessary to be added, there will suddenly result, and appear new *Colours*.

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1. As *Spirit of Turpentine*, though of it self it be clear, if it be poured upon *Saccharum Saturni*, (or Sugar of Lead) which is also of it self exceeding White, if it be digested upon it, will in a small time become a *Tincture* intercelly or extremely Red.

2. Also *Spirit of Turpentine*, if it be mixed with *Water*, and strongly shook together, will look like Milk; although this milkiness is not lasting, but this oyle *Spirit*, ascending to the superficies is diminished, or plainly vanisheth again. The like of which happens if *Oyl of Olives* be mixed with the *Lixivium*, or Lees of *Vine Ashes*.

3. *Distilled Oyl of Aniseeds*, (which is wont to coagulate, and grow thick with the cold Air,) if a *Leaf of white Paper* be anointed with it, and a few drops of *Oyl of Vitriol* be poured upon it, it will presently grow Red; I say the *Oyl of Vitriol*, not the *Spirit*.

4. *Syrup of Violets*, which is of its self of an obscure Purple Colour, is changed into a vivid and brisk red, if you mix by drops with it *Spirit of Vitriol*: (which knack is now known to all the *Apothecaries Shops*) if you shall add *Oyl of Tartar* to this,

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a *Green Colour* will emerge from thence : which will perish and be lost again, if you add *Spirit of Vitriol* to it again.

5. *Syrup of Piony Flowers*, if you mix *Salt of Vitriol* with it, will become wholly *Black*: the same happens to *Syrup of Clove July-Flowers*, if in the time of boyling it be stirred with an *Iron Spatula*.

6. *Tincture of Coral*, prepared with distilled *Vinegar*, mixed with the *Tincture of Dasey Flowers*, there will result from thence a *Liquor* of an *obscure Blew*.

7. If you mix *Silvius's Sal volatile*, or the like *Urinous Spirit* in small quantity, with the same *Tincture of Dasyes*, or *Roses*, there will arise an *obsure Blew Colour*; but if you drop in a little more, it will be made an *obscure Red*: Neither can you make that *Red Colour* clear, although you should add more (*Spirit or Volatile Salt*) to it. It therefore follows that *acid*, or *four Spirits*, do strike a *red Colour* with clearness, but *urinous* ones with *obscureness*.

8. A *Solution of Lead* made with distilled *Vinegar*, appeareth clear like *common Water*: If you shall add to this *Oyl of Tartar*, (*per deliquium*) which is also clear as *Water*, the mixture will presently grow *White as Milk*.

9. If

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9. If *Antimony* which is calcin'd with *Nitre* be boyl'd in *Fountain Water*, the straining will be clear, and almost without smell, which nevertheless by pouring any *Acid* upon it, will acquire a *Saffron Colour*, with a stinking scent.

10. *Common Water* in which *Mercury Sublimate* hath been infused, doth presently grow *Yellow* by dropping into it *Oyl of Tartar*.

The solution of calcin'd *Tin*, mixed with dissolved *Salt of Tartar* becomes *Blew*. Dr. *Willis* lib. de Ferment. cap. 11.

11. *Quicksilver* and *Sal Armoniack* ground together, and sublimed in a *bolt Head* with a heat of *Sand*, will become a *white Powder*, which suffer'd to dissolve (by it self in the *Air*) will produce a *clear Liquor* like *Spring Water*, which for all its clearness, if *Copper* or *Brass* be moistened with it, they will appear *silver'd*; and if *Copper Vessels* be slightly rub'd with it, it will render them as if they were perfectly *silver'd*: although this be rather an incrustation, (or coating of them over.)

12. But a *Powder* to gild with, is made thus. Dip fine *Lint*, made of *Linnen-Cloath*, in *Aqua Regis*, in which *Gold* is dissolved, and having cast it into

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a *Crucible*, make a *Circular Fire* about it, at a distance ; and so by degrees reduce it into a *Powder* : But towards the end increase the heat by bringing the Fire nearer to the *Crucible*, and at last if you please, take out the *Powder* and free it from durt by pouring Water upon it, it will be without *splendor*, or *shining*, and is of a *Violet colour* ; but if you rub it upon *Silver*, the genuine splendor of *Gold* will appear, which afterwards will be made more splendid, and shining by polishing.

13. *Lignum Acanthinum*, or the *Wood* which is brought from *Brazil*, infused in common Water, will communicate a pleasant redness to it, like that of *red Wine* : If you pour upon this a little *distill'd Vinegar*, the Liquor will appear clear like *white Wine*, but a few drops of *Oyl of Tartar* reduces the Colour to a deep *Purple*, after which, if you drop in *Spirit of Vitriol*, it will be *yellow* like *Sack* : if you cast on it *Salt of Lead* dissolved *per deliquium* (or in the *Aire*) the mixture will be *whitish* like *Milk*. Dr. Willis (lib. de Ferment. cap. 11.) proposeth this Experiment, every Branch of which will answer the Trial but the fourth, for we by adding *Spirit of Vitriol* could not produce

a pale Yellow, but made a certain obscure Blew Colour.

14. Have in a readines a *Solution of Vitriol*, and likewise by it self an *infusion of Galls*. If you pour both of them together, you will make *Writing Ink*. Add *Spirit of Vitriol* to this, and the Blackness will clear up; then cast in *Oyl of Tartar*, and after a little working, and heat, there will appear a *light Red*, or *bright Bay Colour*: which by mixing *Spirit of Vitriol* again will be taken away, all clearing up again: And you may reiterate this Circle as often as you do by turns put in *Oyl of Tartar*, or *Spirit of Vitriol*: So that as often as you please you may render the Liquor of a light Red or Bay Colour, or else clear again.

15. It is also a pleasant Metamorphosis, which is proposed by the excellent Mr. Daniel Major, the Famous Professor of the University of Denmark. Lib. de Chirurg. Infusar. Dub. 9. to this purpose. Pour into a good transparent Glass the *Saphire colour'd Water*, made by the help of *Spirit of Sal Armoniack* being put into a *Brass Basin*: Afterwards add the common *Clystus* of *Antimony*, and the mixture being shook, it will become clear: but if you add

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add to it *Oyl of Tartar* it will be restor'd to its former Blewness.

16. Take one *Ounce* of the solution of *Crabs eyes*, made with *distilled Vinegar*: drop into it of the *Salt Spirit of Sal Armoniack* 120 drops, and you shall perceive the matter to grow *Milky*, and a *white Powder* will fall to the *bottom*, if by turns you pour upon this *Liquor* as many drops of *Joac. Polemanus his Tincture of the Blood-stone*, after some bubling, the *Powder* which lay in the bottom will be dissolved again, and the whole will be changed into an exceeding *Red* transparent *Liquor*, indowed with a grateful *Saline* taste.

17. The change of light doth also cause a new Colour to appear. So we have observed, the Flowers of *Convolvulus* or *Bird-weed* (that sort with the Blew Flower and Ivy-shaped Leaves, with sharp points,) which *Lobelius* calls *Asureum*, in the day time is of a delicate *Blew*, but at night by *Candlelight* it appears of of a *Violet Colour*. Wooden Tables, and such like Utensils, if they be painted Blew, by day shew their own Colour, but by night they appear Greenish.

18. Let there be taken two parts of *Oyl of Tartar*, and one of *Cows Milk*: this mixture

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mixture in a heat of *Sand* will grow *Red*, a part of the *Cheesy*, or *Curddy* part of the *Milk* swimming at the top, if you strain this through a *Cloath*, the *Red Liquor* will be more transparent. Being led by the *Analogy*, or resemblance of this Experiment, I have thought (that I may add this by the by) whether or no the *whitishness* of *Chyle* in an *Humane Body*, being mingled every day with the *red Blood*, doth not perhaps grow red upon the like account also. Although the *common People* wrongfully suppose, this *redness* is induced upon the *Chyle* by the *Circular motion* of the *Blood*: but motion of it self doth hardly appear sufficient for to change the Colour, unless there be hid also in the *Blood* it self a *Saline Principle*, which may continue this *Tincture* so many years, even to old Age, which is perfected by the assistance of the Heart, its Vessels and Heat.

These and the like *Phænomina*, or appearances and their causes, perhaps might be conveniently demonstrated, by the *smallest Particulars* of which these *Liquors* consists. A *Battel* composed of some *thousands of thousands* which may be *dilated*, and *contracted* at the will of the
Commander,

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Commander ; nay being *disordered* by the *Enemy*, may again be rallied, and reduced into *order*. After the same manner, from the *small Particles* of Liquors *dilated* ariseth *perspicuity* and *whiteness* : but from their contraction *obscurity* and *blackness*. Again, according as the *dilatation* and *contraction* is more or less, there will arise intermediate Colours ; *Yellow*, *Red*, *Green*, *Blue*. Whether those that study the *Opticks* can render a more exact account let them try.

CHAP.

C H A P. III.

*Of the different ways of Distilling;
and particularly of bringing the
Tincture of Simples over the Helm,
or Alimbeck.*

THe various ways of Distilling dependeth partly from the variety of *Furnaces*, of which some are to distil by *Ascension*, others by *Descension*: to say nothing of *Probatory*, *Cementatory*, *Reverberatory*, or *Wind-Furnaces*, partly also from the difference of *Vessels*, of which sort are *Vesica's*, *Cucurbits*, or *Bodies*, *Retorts*, *Phials*, *Alimbecks*, *Receivers*, and others of that kind. All which *Apparatus* or Furniture may not only be seen in our Laboratory, but are also described both by Writing, and Figures by *Andr. Libavius*. *Johan. Rhenanus*, and the rest of those kind of Artists.

There is also other ways of Distilling, respect being had not to the *Furnaces*, or *Vessels*, but to the *Matter* which comes forth during the Operation. For whilst
the

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the *Fire* worketh upon the *Matter* committed to Distillation, *Vapours* ascend, which being collected again fall into the Receiver under the Form of a *Liquor*.

To say nothing of Sublimation [to wit, of *Antimony*, with *Sal Armoniack*] by means of which there will also arise fair, and great variety of Colours in the head of the *Alimbeck*.

Therefore, *first*, as to what concerns the *Vapours*, or *Fumes*, they also differ in their colour. For *Nitre* though it be a *white Body*, yet in Distillation (at a certain time of the operation) gives red *Fumes*. *Vitriol* of it self *Green*, or *Blew*, affords white *Fumes*. *Soot* though it be never so *Black*, yet the *Fumes* which fill the Receiver are so *White*, that it seems to be washed within with Milk.

But *secondly*, as to the *Liquors* which are come over into the Receiver, although all of them compared together are not altogether of the same *Colour*; yet it is certain, if you consider almost infinite plenty of *Simples*, there will be very little difference or variety in them.

Those which draw *Aromatical Oyls*, may easily observe, that they come over not *White*, but *Coloured*: As to instance *Oyl*
of

of Cinnamon is Yellowish, Oyl of Mace is of a Yellowish White, Oyl of Cloves is of a Yellowish Black, Oyl of Rhodium Wood is of a Yellow Colour tending to Red. And as to distilled Waters, I think it worth our remark, that every one of them (not excluding all manner of Spirits) which are commonly found in the *Apothecaries Shops*, every one of them I say are limpid, and without Colour: Notwithstanding the so great variety of Colour in the *Herbs, Roots, Leaves and Flowers* from whence they were distilled. All that *Blackness, Greeness, Blewness, Redness, Yellowness, &c.* is left behind in the bottom of the *Cucurbit*, or in the *Copper distilling Vessel*, or *Vesica*, or rather perisheth: there arising (which is worth noting) nothing but limpid, and almost colourless liquor.

Truly, heretofore this Subject tyred my thoughts, and I have many times weighed this *Problem*; Whether or no amongst so great variety of *Simples*, there were not at least some *Species*, or sorts of them which would bring over the *Helm* or *Alimbeck* with themselves their own *Native Colours*; I mention an *Alimbeck* only as the chief Instrument, not excluding a *Retort*, or any other distilling

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Instrument. That there are some such *Species in Nature* which will do this, Labour hath taught me, nor do I repent the pains; part of these I have my self observed, part I have collected from the *observation* of others: The *Observations*, and *Experiments* are comprised in the following Chapters. Let the Industry of others add more to them.

CHAP.

CHAP. IV.

Experiments in Metals and Minerals.

THAT we may begin this Business, first with *Metals*, although if they be left to themselves, they constantly retain their *Native Colours*, better than *Vegetables* do, by reason of their solidity of substance: yet being tryed with *Menstruums*, or *dissolving Liquors*, they are much varied; there doth also arise much more difficulty in distilling them than in *Vegetables*. The case is the same also in *Minerals*, although the difficulty in distilling them be somewhat less: but let the difficulty be what it will, having made trials in both sorts, we will produce a few; which Experiments (if not all of them in general) yet most of them are made by the help of an *Alimbeck*.

Experiment the first, upon Gold.

Take the *Calx* of *Gold* prepared with
C 2 *Aqua*

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Aqua Regis, and by reverberating reduced to extreme fineness, and an exceeding red Colour; Pour upon it a *Menstruum* (or dissolving Liquor) composed of equal parts of the best Spirit of Wine, and of the *Volatile Salt of Urine*; digest it for fifteen days in a Vessel (*Hermetically sealed,*) with the heat of a gentle Bath, and repeat this as often as there is occasion: Afterwards joyn all the several solutions of the Gold, which will be red like Blood, and digest them for a Week or two. If you then distil this Liquor by a low Body, or Retort in Sand, at length the Gold together with the Tincture will pass over by the *Alimbeck*, with an intense redness, leaving in the Body an acid, black and spongy Earth. Mr. Boyl in his *History of Fluid, and Firm*, Sect. 5. says thus: *We prepare a Menstruum, by the help of which, without much difficulty we can bring over the Helm, at the first, or second distillation, so much Gold as is sufficient to communicate to the distilled Liquor a lasting Gold colour.* 'Tis an Artifice worth remembering, which Joel Langelot, in *Epist. de Pretermiff.* relates in these words: *The Powder of Gold ground in the Philosophical Mill, and put into a little Retort, not too high*

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high an one, but a plain one, such as the English ones use to be; press it by a sand fire by degrees, and at last, with a very strong fire; and so it will distil a few 'tis true, but those exceeding red drops; which digested by it self, or with the Tartarous Spirit of Wine, will become an Aurum Potabile, which is (true, and) not sophisticate with any other peregrine or strange quality.

Experiment the second, upon Silver.

Calcine Silver with Mercury Sublimato, after which pour upon it the very same Menstruum of which mention is made in the foregoing Experiment: and so there will appear a most elegant or lovely blew Tincture; upon which if you pour Spirit of Salt, it will become a green.

Experiment the third, concerning Iron.

The Tincture of it is reddish, and is made, by taking the filings of Steel in sufficient quantity: Pour upon them distilled Vinegar, and extract the redness; afterwards pour on more distilled Vinegar, and reiterate this for a Month, or longer, till you perceive it will extract no more red-

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ness. Then joyn all the *tinctied Vinegar* together, and distil it in *Balneo*, and put *Spirit of Wine* upon that which remains; and digest it so long till it hath drawn a *Tincture*. Abstract the *Spirit of Wine* from it by *distillation*, pour it on again; after you have done this six times, the *Tincture* of Steel is perfect. It is compleat indeed, but the *Tincture* is much promoted by the *Salt of Vinegar*, extracted by the *Phlegm* of the *Spirit of Wine*: but yet so nevertheless, that it is very probable that there is some small portion of the *Iron* in it.

Experiment the fourth, about Copper.

Concerning this the Noble Mr. Boyle, in his *Book of Colours*, pag. 305. observes, That it is a *Metal* upon which divers and distinct sort of Liquors do act so easily, that there is scarce any *Mineral* that will concur to the production of so many different Colours as Copper, it being dissolvable in most sorts of *Menstruums*: To wit, in *Spirit of Vinegar*, *Aqua Fortis*, *Aqua Regis*, *Spirit of Nitre*, of *Urine*, of *Soot*, *Oyls* of divers sorts, and in most other *Liquors*, the Colours of which are not a little different, and various from each

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each other, although they are comprehend-
ed within the limits of *Green*, or *Blew*,
or of a *blewish Green*. But it seemeth the
before praised Mr. Boyl had not took
notice that if the *duplicate Spirit* of *Joac.*
Polemanus made of the *Blood-stone*, and
Sal Armoniack, were pour'd upon *Copper*,
that the *Liquor* would distill over *Green*,
and that *green Crystals* would shoot in
it.

Experiment the fifth, concerning the rest of the Metals.

Tin, *Lead* and *Quicksilver* dissolved in
Corrosive Waters, do not tinge their *Men-*
struums after the manner that we have
related above, as *Gold*, *Silver*, *Copper* and
Iron do, &c. for these *Metals* are of a baser
nature, and *whitish*; wherefore their so-
lutions also are *white*: nor is it likely they
should easily pass over the *Alimbeck* of
another colour.

Experiment the sixth.

When we make *Spirit* of *Vitriol*, if
there be added a little *Vinegar*, the *Spirit*
will come over the *Alimbeck* of a *green*

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Colour : Also the *Pblegm* of *Spirit of Venus*, or *verd. Aeris*, is greenish.

Experiment the seventh.

If you mix *Sulphur*, *Sal Armoniack* and *Quick-Lime*, and distil them by a *Retort*, although they are Bodies which of themselves are not *Red*, yet by distillation they yield a *red Liquor* : which *red Liquor* being rub'd upon the Fingers doth colour them *black*. Mr. *Boyl*, de *Coloribus*, *Experim.* 34.

Experiment the eighth.

Spirit of Quick-Lime, prepared after the way that *Basilius Valentinus* prescribes in *Test.* Part. 5. and from him is repeated by *Thomas Keslerus Process. Chym.* Num. 287. This before it be rectified doth please the eye with an elegant *blowness*.

Experiment the ninth.

Take of *Vitriol* calcin'd to a *yellowness*, one part; *Flint-stones* beaten to a Powder two parts; and of *Spirit of Wine* as much as is sufficient to make them all into a
Past.

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Past. After which if you distill it by a Retort, there will come forth a Red Oyl. To this purpose confer with *Christoph. Glucrad. in Not. ad Tyrocin. Joa. Beguini lib. 11. cap. 6.* Also *Andreas Tenzelius in Exeget. Chymiatrica,* and *Joan. Schroderus. lib. 3. Pharmacop. cap. 26.* Where more Oyls of Vitriol are discovered which pass over the Retort Red.

Experiment the tenth.

This is to be observed concerning *Sinobar*, as well that which is Natural as that which is Artificial; if you put Spirit of Turpentine upon it, and then distill it by a Glass Body in Sand, the Liquor which comes forth will be of a very fine Red Colour.

CHAP. V.

Experiments upon Animals.

WE may admire in the *Animal Kingdom* the diversity of Colours with which the chief Master Picture-Drawer hath most curiously spotted many *Fishes*, and also *Shells*; and amongst *Insects*, *Butterflies* of all sorts; and among four-footed *Beasts*, the *Leopard*, *Linxes*, *Tygers*, &c. but when we come to *Birds*, who is there that is not amazed at the *Feathers* of *Peacocks*, and *Parrots*? But whatever variety there is in this kind in general, the *Alimbeck* makes no discovery of them, for whatsoever passeth over by it, as much as is hitherto discovered, is *Whitish*, only excepting from this rule those which by way of *Gleaning* we have annexed left, this place should be empty.

1. From the several parts of a *Stag*, or *Hart*, various and efficacious *Shop-Medicines* are prepared, amongst which the chief are the *Horns*, whose *Spirit* being drawn by a *Retort*, shines with a *Yellow*, or rather
Golden

Golden Colour ; although I deny not when the *Oyl* is exactly separated it grows *white*.

2. Amongst *Insects*, *Bees* make *Honey* ; from which the *Water* which flows at the beginning of its distillation is *White*, but the following *Spirit* is first *Yellow*, and towards the end of a *Gold Colour*, and so distils constantly, and is of many uses in Art.

3. Of the *Blew Water* of *Gnats*, this following Experiment is produced by *Adamus Lonicerus Herb. German. part. ult. pag. 349.*

Wasser von gemeinen Mussen gebraunt wird blaufarb. Dasselbe bereite also: Spreite ein Sacklein, so Lauft das Wasser durch das Sacklein oder auch in die Kachel. Wo dures aber in einem helm brennest, so Wird der helm kinfend. Water (saith he) *distilled from common Gnats is Blewish, I make it thus : Spred a Cloth over a Caldron, but put the Gnats into a Sack, or Bag : and so let them fall out of the Sack, or Cloath into the Cauldron of Water, which if you distil by an Alimbeck, the Alimbeck will contract a stink. Thustar Leonicerus. Although I do not deny that this way of distilling Gnats is partly obscure, and partly defective.*

CHAP. VI.

Experiments appearing in Vegetables.

Here goes about a *Story* of a great Person that was very *curious*, who having called together to him certain *Alchymists*, shewed them divers *Simples*, which having mixed together, he caused them to be committed to distillation in their presence: but it happened that the *Liquor* as it distilled did breath forth a grateful scent of *Musk*. When this Illustrious Person required of these *Artists* a reason of this Odor, for they saw not the least Grain of *Musk* mixed with the *Simples*; They afflicted themselves all day long, and yet could produce no reason for the thing, unless this *fragrant* scent did arise from the *mixture* of the *Simples* in a certain proportion; at length, about the Evening, the Nobleman discovered to them the fallacy, to wit, that unknown to them, he had put *Musk* into the Nose of the *Alimbeck*.

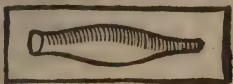
As therefore we may counterfeit a *Scent*, by putting into the *Alimbeck*, *Musk*, *Civet*,
or

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or *Odoriferous Flowers* ; In like manner 'tis possible to fain *Colours* since the *Water* in its passing carries along with it self the *Tincture* of those things which are imposed in the *Alimbeck* : provided you light on such Spectators upon whom this Leger-demain or trick may pass.

1. The most facile way of all is, by putting *Flowers* into the *Beak* or *Spout* of the *Alimbeck*, (for example) put in *Blew-Bottle Flowers* : so the *Water* by passing through them will gain a *Blew Colour*.

2. If you think it necessary to do the thing with more care, put betwixt the *Beak* of the *Alimbeck* and the *Receiver*, a *Fistula* or *Pipe*, wider in the middle then at each end, or *Bellyed* like a *Bottle*, in which let those *Flowers* be contained (the Figure is thus.)



—Moreover this *Pipe* ought to be somewhat wider in its uppermost end, and narrower in its lowermost : as is to be seen in the *Figure*.

3. This

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3. This is a Spectacle for Mountebanks to shew upon a Stage, Thus: if there be four *Cucurbits* or Bodies full of *Water* all in one *Furnace*, put an *Alimbeck* upon each of them, let it be done so that the *Alimbeck* may only be seen, and the Pipes, or Beaks hid. Let there be put into every Beak several Flowers (for example) *Blew-Bottles*, *Violets*, *Marygolds*, *Red-Roses*, *Saffron*, *Sanders*, &c. suddenly by the help of the Fire the Liquors which are forced into the Receivers will obtain different Colours; not without the admiration of the common People which stand by. The same thing may be performed with those *Bellyed Pipes* put betwixt and covered.

4. This also is for ostentation, and shew: If you take one, or more *Walnuts* made Hollow and Empty, and fill them with the Spirit of the roots of *Saphire*, coloured *Pimpernel*, describ'd below in the 15th Chapter, and stop them up lightly with wax. Then before the Spectators take these Nuts thus filled, and cast them into a vessel half full of *Spirit of Wine*, and putting on an *Alimbeck*, distill it in Sand; from the heat within the *Wax* will be melted, and the matter flowing out, the clear Spirit will be so tinged that to admiration it will appear all *Blew*.

CH A P. VII.

Of Veronica or Fluellin.

But some body will answer; Ah! but these are fallacies. Tis true. But you must know, that these ridiculous things are also necessary, lest you be deceived your self, and that you may be able to detect the fraud of others. *Aristotles* Sentence concerning a wise man is this: *Qui ipse non mentitur, & alium mentientem facile deprehendit. Who is not false himself, and can easily discover the falshood of others.* But now passing over crafty cheats, let us proceed to *Operations*, which are *Genuine*, and agreeable to truth.

Veronica, or *Fluellin*, is a Plant known to all the *Apothecaries*, and its Vertues both as to the *Breast*, and *Spleen*; also its curing of *Ulcers*, and *Wounds*, are much cryed up to the Sick. Whether it were known to the Antient Writers both *Greek* and *Latin*, is uncertain: Although *Casalpinus* refers it to *Diascorides*, *Myosotida* or *Mouss-care. lib. II. cap. 214.* others make it another Plant. The kinds of it are commonly

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monly (by *Herbalists*) recorded to be eight: amongst which the most usual is that which by *Casspar Bauhinus* is called *Veronica Mas*, *supina* & *vulgatissima*. The *Male Fluellin* the *Superior*, and most common. There is prepared from it a *Syrup*, *Conserve*, *Salt*, *Wine*, and also *distilled Water*: of the former nothing, but concerning the *Wine*, and the *Water*, take a couple of *Observations*.

Experiment the first.

Take fresh *Veronica*, when it begins to be in the *Flower*, cut it, and sprinkling it with a little *Water*, cast it into a *Glass Body*, and applying the like *Alimbeck* to it distil it by *Balneo Mariæ*, or *Water*. So the *Water* which distills, will not be white and limpid like to other *Waters*, but *Greenish*. This *Greeness* though it be not constant, yet it will last at least *three months*, and afterwards it will begin to vanish by degrees.

Experiment the second.

If in the place of *Fountain Water* you put on *Wine*, and draw it the same way by
Balneo,

Balneo, you will then also have a *Green Liquor*, but in which the *Greenness* is much deeper, and will also continue for a *year*, and longer.

Truly this neat *Tincture* which *Veronica* brings over the *Alimbeck* with it, seems to be a *Note*, or *Character* of the efficacy, which is indulged to that *Plant* before a thousand others.

Let no *Body* here accuse *Copper* for giving this *Tincture*: for if the distillation be made in *Glass Vessels*, the *Water* of *Veronica* will be equally *Green*. The latter way by *Glasses* is best to perform it, and by that means it will clearly evidence that this *Greenness* doth not proceed from *Copper*, but springs only from the peculiar *Nature* of the *Plant*.

But concerning *Vegetable Waters* distilled by *Copper Vessels* not exactly *Tyn'd*, we have observed this; if they contain any thing of *Copper*, by putting in a *drop*, or two of the *Salt Spirit* of *Sal Armoniack*, they will become *Milky* or *White*; but if they have no *Copper*, they will remain clear. However the observation of *Otto Tachenius* (an excellent *Physitian* of *Venice*) may seem to look otherways, concerning *Rose-Water* distilled by a *Copper-Vessel*; which

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he proposeth, chap. 19. Hippocr. Chymic. to this sence: *It doth eat off certain Atoms from the Copper, which are invisibly mixed with the Water. Would you see the Copper? drop into the Water some drops of an Urinous Alcaly, and by it the whole Water will grow greenish: because the acidity of the Rose Water, doth with more greediness snatch to it self the light, and more like it self Alcaly than the Metal, which therefore by degrees falls Green to the Bottom.*

Whilst I am writing this a certain not in-expert Man in the Art of distillation doth affirm, that the *Water of Sage*, and also of *Rosemary*, will be *Green*, as well as that of *Veronica*, if they be managed with a certain dexterity, and moderate swiftnesse. The truth of which *Experience* will determine.

CHAP.

CHAP. VIII.

Of Camomil.

BOtanists, or Herbarists, are wont to reckon ten sorts of this Plant, amongst which the most eminent are the common Camomil with the Noble Flower Single, and with the full, or double Flower Camomil without scent, and stinking Camomil or May-weed; but I shall chiefly have to do in this place with the first sort or common Camomil.

The distilled Water of this is to be had in Apothecaries Shops after the manner of other waters limpid and colourless. There is also to be sold its Oyl, made by infusion from the Yellow Flowers. But that which is made by distillation from the same Flowers is very different from this, for it is deeply saturated and fill'd with a Saphire Colour, very pleasing to the sight.

Experiment I.

Take the fresh Flowers of common Ca-

D 2

momil

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momil, sprinkle them with fair Water, and bruise them together; after they have stood some dayes cast them into a Copper distilling Vessel, well covered with Tin, and applying a Head to it, distill it. The Water being drawn forth, you shall perceive the Oyl to swim at the top of it, which though it be but little in quantity, will be of a true Sky Colour.

Experiment 2.

We have with the same success tryed the same, with the *dried Flowers*; but the infusion of them stood for fourteen days, to procure the greater extraction.

Experiment 3.

If you mix with them a handful or two of *common Salt*, or the like quantity of *Tartar*, the *Blaw Oyl* will come over in greater plenty.

Experiment 4.

We substituted in the place of these the *Flowers of Roman Camomil*, but we had then a *Yellowish Oyl*, not a *Sapphire coloured*
one :

one: what there is to be found in the rest of the sorts of *Camomil* we have not yet tryed.

Experiment 5.

This innate *Blewishness* of the *Camomil* is of that *contagious*, or *communicative* Nature, that it is able to infect other things, and render them like it self. For Example: Take the tender tops of a *Pine*, or *Fir-tree*, and being cut into pieces, cast them into a *Copper Body*, adding a good quantity of *Camomil Flowers*, distill them by themselves, and there will come over a compound *Oyl*, which may be named *Oleum Pini ceruleum*, or the *Sky-coloured Oyl* of *Pines*.

Experiment 6.

After the same way you may prepare the *Saphirine Oyl* of *Juniper*, by mixing with a fit proportion of the *Camomil Flowers*, some *Juniper Berries*; and this not without a communication and exaltation of the *Medicinal Vertues*, with which the *Juniper* it self doth abound.

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Experiment 7.

The same way the shavings of *Lignum vite*, being mixed with the *Flowers of Camomil*, you may make a *blewish Oyl*; which though it be well scented of it self, yet adding *Oyl of Rhodtum* to it, it will be rendered more odoriferous.

Experiment 8.

Nay these *Flowers* seem to be of such a disposition, that whatsoever *Rosiny matter* they are mixed with, they yeild a *Saphirine Oyl*. An Argument worthy a further speculation, whether or no by this Method many more Oyls may not be prepared against particular *Diseases*, by the mixture of peculiar and specifick rosinous Simples.

Experiment 9.

There is a *decompound Oyl*, which is described by *Boetius. lib. 11. de Gemm. & Lapid. cap. 43. Impostures* (saith he) joyn the *Flowers of Camomil*, and the *white Oyl* or *Spirit of Turpentine*, and a very large proportion of *Artificial Sal Armoniack*. They put
this

this mixture into a *Copper Body*; and to this they add *common Water*, from whence they distil *Water* and *Oyl* after the common way. The distilled *Water* contains on the *Superficies* or top of it *Oyl* of a *Colour* like a *Saphire*; this is *Oyl* of *Turpentine* joyned with the *Oyl* of *Camomil*: for this *Herb*, or the *Flowers* of this *Herb*, do yield some of the *Oyl*: But the *Colour* is produced by the *Sal Armoniack*, which it extracts from the *Copper*, and communicates it to the *Oyl*. If the *Oyl* be kept long it will be spoyled with age, and then you will manifestly discover the Scent of *Turpentine*. This is an usual cheat with common *Chymists* or Preparers of *Chymical Medicines* for the Shops here in *London*, because many are deceived by this means, and many *Chymists* are so simple to think the *Colour* proceedeth from the *Camomil*. I thought fit hereto discover the *Imposture*, *Cheat* and *Error* of *Chymists*.

Thus far *Boetius*, who in vain suspects a fraud in this matter: For, as we have shewed before in the first and second *Experiment*, that also without any manner of *Salt*, either *common*, or *Armoniack*, a *Skicoloured Oyl* may be drawn from the *Flowers* of *common Camomil*; wherefore the *Co-*

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lour doth not result from the *Copper Body*: for otherways the same thing would happen in distilling other *Plants* in a *Copper Body*, which nevertheless is very far from being true. It remains therefore in these operations, that the *blewishness* is produced altogether from the *Flowers*. But what is affirmed by *Boetius* concerning the *blew Colour* being drawn out of the *Copper* by the *Sal Armoniack*, signifies nothing in this case, That being an *Artifice*, commonly known to *Barbers*.

Experiment 10.

As to what concerns the *duration*, or lastingness of the *Oyl*, we have an *Oyl* which was extracted from *Camomil Flowers* above three years since, without the addition of *Salt* or *Tartar*, whose *Saphire Colour* appears so constant, that if it continue not for ever, yet it seems to promise to last many years. Nevertheless I do not deny what *Boetius* alledgeth, of his false *Saphire Oyl*, that the *Blew Colour* doth perish with Age, and that the whitishness of the added *Oyl* of *Turpentine* will emerge or be apparent.

CHAP. IX.

Of Lignum Nephriticum, or the wood against the Stone.

CAsper Baubinus in pinnace Botanic. calls this Wood, *Lignum peregrinum*, five *Mexicanum*, *Aquam cæruleam reddens*, i. e. The strange, or Mexican wood, colouring Water Blew. And places it among the Species or Kinds of *Ash* trees. *Franciscus Hernandes* in his Book Intituled *Theſaurus Rerum Medicarum Novæ Hiſpaniæ*, which afterwards was published by *Nardus Antonius Recchus* in the 4th Book, chap. 25. ſays thus: 'Tis called *Coatlis*, by others *Tlapalezpatl*, or the Medicine of the Scarlet or Crimſon coloured Blood. It is a great Trees-Shrub, with a body thick and without knobs, like the Pear-tree wood, the Leaves like Sheep Peaſe, or Rue, with a Yellow Flower growing among Prickles. It is alſo excellently deſcribed by *Nicol. Monades* in his *History of Simples*, chap. 27. in theſe words; *Mittit Nova Hiſpania Lignè quoddam genus craſſum & erode, Materiæ piri, cujus*

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cujus usus jamdiu receptus fuit in his Regioni-
bus, ad Renum vitia, urineque difficultates
& incommoda. Postea experimento comproba-
tum est, ejus Aquam in Jecoris & Leinis ob-
structionibus utilem esse. Illa autem hac rati-
one paratur, Lignum assutatum, & minutum,
concisum in optima & lympidissima aqua fonta-
na maceratur, atque in ea relinquitur donec a-
qua à bibentibus absumpta sit. Dimidia Hora
post injectum lignum aqua cæruleum dilutio-
rem colorem contrahit, qui sensim intenditur
pro temporis diuturnitate, tametsi lignum can-
didum (potius ruffum) sit, cæruleum ideo
dico quoniam adulteratur alio ligno simili,
quod aquam croceo colore inficit, ne quis falla-
tur. 'That is, there is sent from New-
' Spain a certain kind of thick Wood,
' without Knotts, like the substance of a
' Pear-Tree, it hath been long made use
' of in these parts, against the distempers
' of the Kidnies, and the difficulties, and
' inconveniences of making Urine. After-
' wards it was found by experience that its
' Water was beneficial in the Obstructions
' of the Liver, and Spleen. It is prepared
' after this manner; The Wood being
' shaved and smal cut, let it be steeped in
' the best and clearest Fountain Water, and
' left in it till it be consumed by those that
' drink

‘drink it: Half an hour after the Wood is
‘put into the Water, the Water will con-
‘tract a pale Blew, which is heightned by
‘degrees according to the time it remains
‘in it, and yet the Wood is White (or rather
‘Brown.) I therefore mention this Blew-
‘ness, because it is counterfeited with
‘another Wood like it, (which gives the
‘Water a Saffron Colour) lest any body
‘should be deceived.

This *ἐνχέριον*, or knack, is now a
daies commonly known, and certainly
except it were so well known, it would
be more esteemed. Of which *Fire* is an
Example: which although there be no-
thing more admirable then the nature
of it, yet we despise it as a common
thing; which were it brought from the
remotest parts of the *Indies*, and sudden-
ly and unthought-of shewed to us, I doubt
not with how much amazement we should
contemplate it.

Experiment 1.

Being about therefore to search, if that
Golden Blewish Colour, would remain
with the same constancy in passing over
the *Alimbeck*, I cast into a *Glass Body*,
the

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the infusion, together with the rasped shavings of *Lignum Nephriticum*, and drew it off. The *Distilling Water*, although it lost both the *Colours*, and was become clear: yet for all that I observed that it breathed forth a grateful *rosinous Odour*. But the Scent of the Shavings themselves might be observed to be much more pleasing, although the crude Wood of it self was almost ὄσμον, without Scent.

Experiment 2.

We substituted in the place of Fountain Water *Spirit of Wine*, which being poured upon the shavings, in like manner became of a double Colour: But being drawn over by the *Alimbeck*, it became White like common Water. And because I easily foresaw, that I could do nothing further with this Wood, by distillation with an *Alimbeck*, I desisted: yet nevertheless I tryed other ways, and the *Experiment* which follows was produced thereby.

Expe-

Experiment 3.

We distilled some drops of Oyl of Tartar *per deliquium* into the Golden Blewish Coloured Infusion, made with common Water, and we perceived both the Colours remained constant.

Experiment 4.

We poured into the same Infusion Spirit of Vitriol drop by drop, and the aforesaid blewish Colour vanished, the Yellow one only remaining.

Experiment 5.

We tryed the same with Spirit of Salt, Sulphur, Nitre, &c. and the Golden Colour continued, the Blew one disappearing, as it did happen in Experiment the 4th. A clear sign that the acid Salt by its penetrative power did infringe, and otherwise dispose those Particles, which the Urinous, and as it were blunt Salt of Tartar could not infringe or otherwise dispose.

Expe-

Experiment 6.

Many considerable Remarks are produced concerning this *Nephritick Wood*, by that *careful* and industrious searcher after *Nature*, Mr. Boyle in his Book of *Colours*, *Experiment the 10.* and in those which follow, which worthily deserve to be read. But I may repeat one of them here, which concerns the redintegration of the once lost Blew Colour. But because the Authors Relation is a little too long, I will repeat it with more brevity. Drop into the *double coloured* Infusion of the Wood, a few drops of the *Spirit of Wine Vinegar*, so the *Blew Colour* will vanish, the Saffron one remaining. Upon this pour a little *Oyl of Tartar per deliquium*, and immediately the Blew Colour will return, and the Infusion will appear as before of two Colours, perhaps by the *acidity of the Salt* the *Particles* are broke, and returned to their former position; which were kept under by the heavy *Oyl of Tartar*.

CHAP. X.

Of the Dregs of Wine, of wild Carnations, or Pinks, and Parsley.

OLd Wine deposits two sorts of Excrements; *to wit* Dregs, and Tartar. The Dregs are the grosser, and earthly parts of the Wine which after fermentation it lets fall (like Slime and Mudd) to the Bottom of the Vessel, it not being void of a useful *saltness*, from whence the *Wine* gains strength: So that taken from this root as it were, and put into another Vessel, it will not endure any long time, but will easily degenerate.

Concerning the usefulness of these *Fæces*, or Dregs, we have a testimony in *Brandy*, or *Spirit of Wine*, which the *Vintners*, and *Distillers* make from them: That we may omit other uses now, which are not unknown to the common people.

But this we suppose is hardly taken notice of by every body, that an *Oyl* is to be prepared from these *Fæces* or Dregs which ascends the *Alimbeck* of a *Green Colour*. In this

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this Operation 'tis to be observed, that that Oyl is most green which distilleth last, but this *Greenness* doth vanish with length of time: Nay presently, if you rectify the Oyl, it being changed into a *Yellowishness*. Let the distilling vessels be well covered with *Tin*, lest you suppose the *Tincture* doth arise from the erosion of the *Copper* in its passage. Many affirm that from the pressings, or husks of *Grapes*, an Oyl may be likewise made, after the same manner, which will ascend *Green*: *Wild Pinks*, or *Carnations* whilest they are in *Flower*, and running up to *Seed*, if the whole *Plant* be fresh gathered, cut small, and distilled after the usual manner, there commonly swims on the top of the *Water* drawn by the *Alimbeck*, a *Greenish Oyl*.

You will find the same thing to be true, with the *Garden Smallage*, or *Parsley* distilled after the same manner, if you have wrought aright: but this *Greenness* is but temporary, and of small duration. But the Oyls of *Cbervit*, and *Parsley* which are to be seen in the *Shops*, are wont to be prepared by long *fermentation*, and are of a deep *Gold Colour*, which they constantly retain.

C H A P. XI.

Of wild Flower-de-luce.

IT is called *Iris*, and receiveth its name from the similitude it hath to the *Rainbow*, it being variously painted with the colours of divers Flowers. From the *Form* of the Roots it may conveniently be divided into *Classes*, the first of which is contained under that of the *Bulbous*, or round rooted, and are in number twenty: the other sort is *tuberous*, or full of swellings, and of this sort truly there is but one: The third sort is *Geniculate*, knotted, or *jointed* on the stems, of which there is about sixty four; the *jointed* are subdivided into *broad leav'd*, *narrow leav'd*, and *dwarfs*. First the *broad leav'd*, which is called by *Casper Bauhinus*, the common *wild German Flower-de-luce*, which is so well known, that it is called in the Shops our *Orris*, or *Flower-de-luce*. They commonly reserve only its root, from whence they make *juice*, *Oyl* by infusion, and a Powder called *Fæcula*: The *blewish Flowers* are beheld for their neatness, but

E never

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never preserved or kept. Moreover, *Joachimus Camerarius* in his Notes upon *Petr. Andrea, Mathiolus German Herbal*, which was printed 1590 at *Frankfort*, to wit, upon the first Book, *cap. 1. fol. 2.* layeth down an observation concerning these *blew Flowers* worthy our noting, in these words, *Das Wasser aus den Blumen der schonen iris destilliret, ist gut fur die Wassersucht : and ist solches viel krassriger, Wana also dasselbe destilliret wird, dak es der blumen natrlich Farbe behalte, wie den solches ohne allen frembden Busa Brichtlich geschehen-san.* *Water* (says he) *distilled from Flower-de-luce Flowers is available in the Dropsy, and is the more efficacious if it be so distilled that it retains the native colour of the Flowers : as also it may easily be perform'd without any strange additament.* And truly except we will impute the crime of fallhood to *Camerarius*, there is a way to be found by which a *blew Water* may be distilled from that Plant, but the way of doing this *Camerarius* himself ought to have discovered to have freed himself from censure, lest there arise a suspicion in the *Readers*, that the thing is done by the *Artifice* mention'd above, in *Chap. 4.* for whether or no the

Water

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Water distilled by the common method will be *Blew*, we have not yet had leasure to try.

Curcuma, or *Turmerick roots* are vulgarly known, but the entire Plant few are acquainted with. The figure or picture shews it to be *Indian Saffron* (to which the name of *Curcuma* is added) also it is clearly described by *Jacob Bontius* in lib. 6. *Histor. Oriental.* cap. 30. put out by *Guilielmus Piso* in his Works printed 1658. He attributes to it the Leaves of *white Hellebore*, and *purple Flowers*, with a fruit prickly, or like the outward hairy barks of *Chestnuts*, which includes a Seed of the form of a Pea. If there be poured well rectified *Spirit of Wine* upon the Powder of common *Turmerick*, the *Liquor* being distilled somewhat swifter than ordinary, will be of a light *yellow Colour*, which yellowness will continue so long only as it shall be kept in a cold and shady place : but it is easily dissipated, and caused to vanish, by the rayes of the *Sun*, or any other heat. But if any do contend that this yellowness is caused by the coming over of very small particles of the *Turmerick* with the *Spirit*, by reason of the swiftnes of the distillation, I will not stiffly deny it.

C H A P. XII.

Of Sun-dew.

Some Plants comprehend many Species or kinds under them, as *Tulips*, *Hawk-weed*, *Cranes-bill*, *Orchis*, or *Dog-stones*, *Treacle Mustard*, and *Grass*. Others contain no variety of kinds, in as much as we hitherto know of; as *Annise*, *Cymbalaria*, or *Bastard-Italian-Navelwort*, *Wall-Rue*, *Matthiolus his Orpine*. Others hold a middle betwixt these, and contain but few Species or sorts: As, *Goats-Rue*, *Liquoriss*, *Celandine*. And the last of the three is the most ample, containing under it, amongst other sorts, a Plant of a most excellent structure, which from a dewy Liquor which stands upon the leavs of it, even when the *Sun* is hottest in *Summer*, is commonly called *Ros Solis*, or *Sun-dew*. Nor do our *Botanists* know more then two species, or sorts of it: of which one sort is called *Sun-dew with the round Leaf*, and is the most usually known in the Shops. The other which
is

ir rarer with us, is wont to be called *Sun-dew with the longest Leaf*.

Experiment 1.

Take either of the sorts of this Plant fresh and new gather'd, and let it be the whole Plant, and in the middle of *Summer* gather'd in a *hot clear Air*; after you have made it all clean, cut it, and sprinkling it with a small quantity of *Water*, let it be bruised; then put it into a *Glass Body*, and without addition distil it by an *Alimbeck*. There will come over (not without the delight of the Beholders) a *Golden Liquor*, tending towards redness.

Experiment 2.

We would try the same also with the *dried Plant*, pouring *Spirit of Wine* upon it; after standing some hours, by the help of a *Bath*, we distilled it with *Glass Vessels*, observing (which was a pleasant Spectacle) the Liquor distilled by the *Alimbeck* was of a Gold colour. Concerning the causes of this effect, if I may guess, I believe the *Sun-dew* is so composed, that it abounds with *volatile Salt*,

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which in the time of distillation doth joyn it self with the *Rosiny Particles* which are dispersed through the whole *Plant* : for if you behold its external face any manner of way, you will easily discern it to grow *reddish* from goldishness. Moreover this must happen from a peculiar proportion of *Salt* : because there are not wanting many Herbs which are both *reddish*, and *rosiny*, whose distilled Waters nevertheless do not in the least look *reddish*, or *yellowish*.

After we had made these our *Experiments*, we happened upon *Conradus Kunraths*, *Medulla Distillatoria*, who in the fifteenth Tract written upon *Ros Solis*, propounds (after his custom) a tedious method of making Medicines out of this *Plant* ; and amongst other things asserts, that the *distilled Water* of it is *yellow*, and that there is to be prepared from it a *Quintessence* which is a *Panacea* in all manner of diseases. Which thing we will leave to its *Author*, or rather to *Isaac Hollandus*, out of whose Book, intituled, *De Opere Vegetabili*, all that *Kunrath* hath writ seems to be taken.

CHAP. XIII.

Of Blew Pimpernel, and of Curcuma, or Turmerick.

THE Family, or kind of Pimpernels may be conveniently divided into two Classes. The first contains those Pimpernels called *Sanguisorbæ*, or Burnet, of which there are four sorts: to wit, the greater, the lesser which is hairy or rough, the lesser which is smooth, and that which is without scent. Of the latter sort are those Pimpernels commonly known by the name of *Pimpinella Saxifraga*, of which five kinds are reckoned up by *Bouhinus* in *Pinac*: that is the greater with the white boss or Top, the other greater, the greater with the red boss or Tuft, and the lesser with the thin Leaf. To which may be added those which were unknown to *Bouhinus*: *Pimpinella Cadanensis Maxima* of *Jacobus Cornutus*, and the *Pimpinella Maxima Cadan.* with the long red spire or ear, and that with the red ear conglomerated, or heaped together, of *Robert Morisons*; also *Pimpinella*

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nella Agnimonoides, of the Physick Garden of Padua.

But besides all the aforementioned, there is another sort which grows with us, in the Fields near the City, which for certain reasons we call the *Blew Pimpinell*; the same also may be found near *Steinford*, a place six Miles distance from hence, where it is propagated in the *Physick-Garden* of the *Court*; and also at *Frankfort* by the way side.

If you regard its *Figure*, it doth not seem to belong to those sort of *Pimpinels* called *Sanguisorbes*, but to that other sort called *Saxifraga's*, amongst them to these called *Major Umbella*, *Candida*, or the greater with the *white boss*, or *Tuft*, to which it approacheth very near. But again it doth differ from it; *First*, In the *Native Soil*, or place of its growth: for *Blew Pimpinels* grow in a *blackish Earth*, but the other in a *sandy*. *Secondly*, The root of *Blew Pimpinels* is outwardly of a gray colour, and inwardly is white: the other root is white both without and within. *Thirdly*, These roots do abound within with a *blewish juice*, which is never seen in the common sort, for which cause it hath seem'd convenient to me to
give

give it the name of *Blew Saxifrage Pimpinel.*

Experiment 1.

It is a wonder that so fine a Spectacle should be so long unknown, which this Plant distilled can expose to the sight; for if the *roots*, either *fresh*, or *dried*, be cut into *pieces*, and *Spirit of Wine* poured upon them, it will be tinged with a *yellow Colour*, and if you distil it by an *Alimbeck*, the *Liquor* will pass over of an exceeding *Saphirine Colour*. The *Spectators* which are ignorant of the thing, will be amaz'd, and be ready to swear there is some juggle or cheat in it.

Experiment 2.

But if you put the *roots* either cut, or bruised, into *Oyl of Turpentine*, with a triple proportion of *Fountain Water*, and afterwards shake the *Glass*, the *Oyl* that swims at the top when it stands still, will be *Blew*: and if afterwards you distil all of it with a strong fire in *Sand*, the *blew colour* will vanish, and the *Oyl* which swims upon the *Water* will be of a *Gold colour*.

Expe-

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Experiment 3.

Wherefore if you have a mind to transfer this operation to a Medicinal use, and particularly to prepare a *Physagogal blew Water*, then let there be added with the roots of this *Pimpinell*, the seed of *Anise*, *Fennel*, and the other *Carminatives*, or breakers of wind.

Experiment 4.

If you have a mind to make a *blew Water against the Stone*, then add to these roots, the seeds of *Winter-Cherries*, *Parsley*, and such like; but if you would have the *blew Colour* to prevail, there ought to be more of the *Pimpinell roots* then of the rest.

Experiment 5.

If you take equal parts of the *blew Pimpinell roots*, and of the Herb *Sun-dew*, and mix them together, and then put them into *Spirit of Wine*, there will flow from them, distilled by an *Alimbeck*, a *Liquor* of a most pleasant *Sea-green colour*, the *blew-ishness*

ishness being refracted or broke by the native redness of the *Ros Solis*, or *Sun-dew*.

Caution 1. No waterish Liquor will extract the *Saphirine* colour of these Roots, but it ought to be a *Spirituos* Liquor; but the best way of all is, with *Oleaginous* Liquors, by reason of the resemblance betwixt them, and the *Rosinous* juice of the Roots. This is further to be added, if you pour *Oyl* of *Citrons* upon them, they will presently after a little stay let fall their *blew* Colour.

Secondly, The distillation in these Operations is not to be too gentle, for then the Liquor will be *white*, but a little *brisk*, and *swift*; so at first the Liquor will be of a *blewish* white, but the latter will appear of a perfect *Saphirine* colour.

Thirdly, This *Blew* colour (as you may observe in the two former Experiments) is not so very lasting, but that after *three* or *four* Months it will degenerate into *yellowness* by degrees, but it will endure the longer if it be kept out of the rayes of the *Sun*, and in a *cool* place.

Fourthly, These Roots ought to be gathered in the *Spring*, *Summer*, or *Autumn*, and to be kept all the *Winter*: for the *dryed* Roots, as well as the *fresh*, are fit to produce

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produce this *Phænomenon*, or appearance : although by very long keeping the *Blew juice* is dissipated, and after the manner of other *Roots* they become useles.

Fifthly, Sometimes we steep the very fresh gathered *Roots*, only in *Oyl of Turpentine*, and have observed that the day following a *Sea green*, not a *Blew colour* to arise : And although we afterwards added a triple proportion of *Water*, and by fits shook it strongly, yet the *Oyl* which swam at the top, remained of a *Sea colour*.

CHAP. XIV.

Of Cinnamon.

BY reason of the difficulties, and length of Navigations, there hath been related both by the Ancient Greek, as well as *Latine Authors*, many uncertain, and also *fabulous* things concerning Cinnamon. And from hence, heretofore there hath sprang so many controversies amongst *Botanists*, about the differences and identities of Cinnamon, and *Cannella*; which quarrels will be easily determined by reading of the writings of latter *Authors*.

The most noble sort of Cinnamon is the *Cannella Zeilanica*, or the Cinnamon of *Zeilan*: the next to this, is that of *Malaver*, or *Java*: the next is, the *Peruvian*. Nor must we pass by the *Clove Cinnamon*, or *Clove Bark*, so called from its taste, which in this Age begins to be brought to us from the *Southern Provinces of America*, called *Guiana*.

But

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But the History of *Cannella* is above all others most exactly described by *Gulielmus Piso*, cap. 1. and 2. of his *Mantissæ Aromaticæ*, which he hath described and annexed to his splendid and neat work, *De Indiæ utriusque re naturali atque Medica*. Printed Anno 1658 at *Amsterdam*. I confess I was not a little joyed when I turning over this *Volume*, first beheld the Cut or Figure of the intire *Cinnamon Tree*: having been troubled at the negligence, shall I say, or ignorance of the rest of *Herbarists*, for almost every one of them in their *Commentaries*, have hardly afforded us but one Leaf, with a Berry, with a small Pipe, or Stem. Moreover, because this *Author*, as *Johan. Johnstonus* (who follows his steps in his *Hist. Nat. de Arboribus*,) is not to be found in every bodies hands, and that besides there is hardly any hope left, that this Tree will ever be procured to grow in our colder *Clymat*: Therefore we esteem so much of this *Cardinal*, and most fragrant *Spice*, that being led by the example of *Piso*, I have caused its *Effigies* to be ingraved, and that it might be the better known to our *Countrymen*, have taken care to insert it in this place.

But



*Cinamon of
Zeilan.*

Tho. Cross sculp.

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But that we may draw nearer to what we design, there is made of this Bark a *Water* to be had in the Shops; which if you reckon to be the first of *Aromatical*, or spicy ones, you will not be mistaken; for it is so *cordial* and friendly to the *Vital Spirits*, and doth so powerfully expel *Wind* in the *Stomack* and *Guts*, and also is so grateful, and pleasing to the *Palate*, that it leaves other Spices much behind it. They are wont to distil it with Wine, or without with *Borage Water*: either way that which first distils over the *Alimbeck*, is of a *Milky colour*. But this Milkiness is hardly native, or true, but doth proceed from the Oyl, with which this Spice doth abound: which being dispersed through the *Water* in small *Particles*, causeth a *Milky colour*: And if these, as it were *Atomes*, shall by length of time be united, they will be carried to the top of the *Liquor*, and there will shew themselves small *Oily drops* of a *Golden colour*, leaving the *Water* clear: although that Oyl, if it be somewhat more plentiful, doth usually at last fall to the bottom.

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Nor ought this so to be interpreted, as if this milky Colour were only proper to *Cinamon water*: for it appeareth also in the *Water of Cloves*, *Nutmegs*, and the rest of waters drawn from Spices. But I thought fit to name *Cinamon* above the rest, because, as we said a little before, it doth excel other *Waters*. And also, because it is more frequently used every where.

CHAP. XV.

Of Corrals.

There are three kinds of Corrals: *Red*, *Black*, and *White*. The *White* may also conveniently be distinguished into *branched*, *starred*, *joynted*, and that which is *warty*, or *knobby*. There is also a sort of Corral which is *Red* without, and *Black* within. But that which is prized above the rest in Medicine, is the *Red* called the *Male Corral*, of which Pedac. Dioscorides. lib. 5. cap. 139. Thus: *Sea Corral* is a *Shrub*, which drawn to the top of the *Water* growth hard presently, and swims, and as it is incompassed with aire it concretes, or hardens. Much of it is found in a Promontory by Syracuse. The name of which is *Pachyno*. The most commended is the *Red* sort, of the Colour of a *Daffidil stalk*, or of the deep coloured *Sardix* or *Orient bright Purple*. Being of a long and round figure easy to break, and of a like hardness in every part of it: again, it is of the scent of *Oreweed*, or *Sea-grass*. It is very full of small branches, and is like in form to
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the Shrub Cinamon. The like description to this *Pliny* hath *lib. 32. Histo. Natur.* but that he erroneously alledgeth that these Berries or litle Balls, which are worn for ornament about *womans Necks*, do grow of their own accord on this small *Sea tree*: for it is sufficiently known at this day, that they are made by Turning; and that also might aswell have been known heretofore. Of the same reddish Beads, is to be understood the most antient of Poets, *Orpheus*, in his peculiar verses of *Corral*, in which he elegently prosecutes the vertues of it, and the Fables of it also.

Concerning this bright sparkling *Corral*, whether or no the true tincture of its genuine Colour, can be extracted, hath been already examined: The *Solutions* made with *Juice of Lemmons*, or of *Barberries*, although they delight us with a false shew, yet they will not answer the thing designed: Neither also will those Liquors which after abstraction remain of a *Red Colour* in the bottom of the Vessel. Of this sort may be seen many *Processes* or *Methods* in *Anselm. Boetius. lib. 11. Histor. Gemm. & Lapid. cap. 154.* But many more in *Jo. Lodov. Gansius Histor. Corral. caput 7.* Also amongst other late Authors. The

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business consists in this point, that a reason may be shewed, how without the addition of any suspected thing, there may be drawn either by *Alimbeck*, or *Retort* a *Red Liquor* from *Corrals*, that is, a *Genuine* and true *Tincture*.

Experiment 1.

The forecited *Jo. Lodov. Gansius*, sect. 8. doth testifie that it was sometime observed by the famous Physitian of his time, *Jac. Zuingerus*, That a *Tincture* might be drawn by distillation in an *Alimbeck*, if the *Corral* being made into a very fine *Calx* or Powder, and being well digested with *Spirit of Wine*, it be distilled nine times, first with a gentle distillation, afterwards forced over with a vehement heat, so that the *Water* will come forth first *Yellow*, and at last *Red*, which is believed to be the *Tincture*.

Experiment 2.

The same *Gansius* in the same chap. sect. 16. hath this following. Let the Powder of *Corral* be calcined with *Spirit of Salt*: then wash the *Calx* with distilled water,

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water, that the saltishness may be taken away. After which extract it, by adding *Spirit of Wine*. Let the extractions poured back again upon the *Corrals* be distilled so long till the *Tincture* ascends by the *Alimbeck*. From this separate the *Spirit* by a *Balneo*. Note in this place that what is extracted, is always to be circulated ten days space: and after each time to be *cobobated*, or poured back again, and distilled.

This is to be done six times, always adding new *Spirit*. The *Red Colour* is said to come forth in the *fifth* distillation, and in the *sixth* a *Powder* altogether *Red* will remain at the *bottom*.

Experiment 3.

Agreeable to this way, is that of *Conradus Kunrath* in his *Medulla Distillatoria*, *Traët. 10.* written upon *Corral*, which therefore at this time we will not repeat, but leave untouched.

Experiment 4.

Daniel Sennertus lib. 5. institut. Medic. pag. 3. sect. 3. cap. 9. laies down the fol-

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lowing way. Let *Corral* dissolved in *Vinegar* be impregnated with *Spirit* of distilled *Vinegar* till the *Salt* will receive no more of that *Spirit*; which is performed thus: To one pound of *Corrals*, add two ounces of the strongest *Vinegar*, and distil it gently, there will only distil from it an insipid *phlegm*. The second time add to the *Corrals* three ounces of *Vinegar*, and distil it again, and so proceed every time, adding of one *Ounce* of *Vinegar* more than formerly, and continuing this, so long, till the *Vinegar* distil as sharp, and strong, from the *Salt* of *Corral* as it is put upon it. Let the *Salt* so impregnated be digested for thirty days in *Balneo Marie*, or a Bath of hot Water, and afterwards distill it in a close *Reverberatory*, by a *Retort*, but so that the *Phlegm* may be received first by it self, and then the *White Spirits* by themselves, till all the *Spirits* are come forth, together with an *Oyl*, Red as Blood. This *Spirit* is to be rectified by an *Alimbeck*, and the *Red Oyl* will remain at the bottom. But this *Spirit* poured upon fresh *Corral* doth extract a *Red Tincture* like to *Gum Lacca*, which if it be again freed from this *Spirit* by distillation, and the *Corrals* be joyned with *Spirit* of *Wine*, or some *Cor-*
dial

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dial Water, and by distilling, and cohobation, it will be made *volatile*, and will then be the Tincture of Corral.

Experiment 5.

Also this following is a compendious way. Take of *Red Corrals* three ounces, and of *Sugar* half a pound, being finely bruised and mixed, distil them in a *Retort*, and you will see a *Red Liquor* to come forth.

But it is not to be doubted concerning these *Operations*, that this *Redness* is hardly due to the *Corrals*: but is more owing to the *Spirit of Salt*, *Salt of Vinegar*, *Sugar*, and the like additions: and much of it also to long digestions. Inso-much that these sort of *Tinctures*, are rather to be taken for *Analogous*, then *Genuine*, until the Fates grant us the true one. And truly whilst I am writing this, there is come to my hand the Epistle of that most excellent man *Dr. Joel Langelot* (chief Physitian of the Duke of *Holsteen*, my most Noble Friend.) *De quibusdam in Chymia prætermisiss*, wherein he sets down an hitherto unknown solution of *Corral*,

F 4

which

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which (as I suspect is performed by
Oyl of Citrons) doth first mollify the
 hard Fragments, and afterwards doth
 dissolve them into an exceeding *Red*
Mucilage, or slimy Substance, and after-
 wards (as may be seen) by pouring
 on of *Spirit of Wine* that is *Tartarised*, it
 will go also into an exceeding *Red*
Tincture.

CHAP.

CHAP. XVI.

The Conclusion: Containing three sorts of Observations.

SINCE we have spoken concerning *Colours* emerging, and resulting from *mixture* in the *second Chapter*: we shall not seem to wander from the matter, if by way of *Colephony* or conclusion, we produce also by way of Example, the various *effervescencies*, and *incalescencies* of things, together with their *attenuation*, and *coagulations*. These also are *Chymical*, and afford much light towards the Knowledge of *Nature*, and of the differences of *Acid*, and *Urinous Salts*. As also it will easily appear from hence, which *Saline Spirits* will either suffer themselves to be joyned to each other, or refuse it. Which Doctrine, as it contains under it the foundation of some of the most noble *Operations*, and is not commonly known to all men: So upon its own account it seems worthy to be annexed to our *Distillatory*, by way of *Mantissa*, or overplus.

Obser-

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Observations relating to effervescency, and incalescency, or production of heat.

To begin with those things best known: It is well known to the common people, that if Water be sprinkled upon *Quick-Lime*, it will excite from it both *heat*, and *smoke*: which Operation is by *Brick-layers*, and *Plasterers* called *slaking*, or *extinguishing of Lime*.

2. If you moisten with *Aqua-fortis*, the filings of *Iron*, *Copper*, or *Tinn*, the Glass in which it is done will grow so *hot*, that you can scarce hold it in your *hand*, there also ascending at the same time plenty of *Fumes*.

3. Almost the like effect doth follow, if you poure the *Caustick Water* upon *Quicksilver*, *Lead*, or *Marcasite*. But as to what relates to the more perfect *Metals*; *Luna*, or *Silver*, doth stronglier resist *Aqua-Fortis*, than the imperfect *Metals* are wont to do: but *Gold* doth plainly elude its force, except *Sal Armoniack* be added.

4. You may also observe an exagitation, if you pour *Aqua Fortis* upon *Salt of Tartar*.

5. Pour *Fountain Water* upon calcined
Vitriol

Vitriol, whilst it is yet *warm*, stirring it softly; and you shall perceive it to wax vehemently hot. The same will happen if you pour *Water* upon any *Alcalizate*, or fixed *Salt* whilst it is yet hot.

6. Distil drop by drop of the *Spirit* of *Vitriol*, into the *Salt*, or the *Oyl* of *Tartar* prepared *per deliquium*, and there will be caused a *crackling noise*: which being finished there will appear a *coagulum* which is commonly called *Tartarus Vitriolatus*.

7. Mix the same *acid Spirit* of *Vitriol*, or of *Sulphur* with the *Gall* of an *Ox* (which is fill'd with its own native *Urinous Salt*,) and you will presently perceive them to fight. But the ebullition will be much stronger, if you mix *Gall* with *Aqua-fortis*: insomuch that a great disturbance will follow it, and a *White froath* will arise a great height upon it.

8. If the Genuine *Red Oyl* of *Vitriol*, and *Spirit* of *Turpentine* be mixed together; the *Glass* doth begin to wax so very hot, that it cannot be touched by naked hands.

9. Neither doth the *Spirit* of *Salt Nitre*, or *Peter* will agree with the *butter* of *Antimony*, but these two *Liquors* being mixed together, are seen rather like *Enemies* to fight between themselves.

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10. I had lately reserved for a use, *Spirit of common Salt*, and after it was consumed, I put into the Glals (perhaps whilst it was yet moist) *Spirit of Sal Armoniack*, tinged with the *Flowers of Brass*, (which many now a days call the *Saphirine Spirit*) I observed when I poured it in, immediately the first drop stirred up a *Cloud* in the *Glass*, and a *Smoakie Vapour* did manifestly exhale from it. A not obscure Argument, that these two Spirits were almost insociable, upon the account of their contrary *Salts*.

11. To this place belongs the Observation of *Regnerus de Graff*. in his Book *de Succo Pancreatico*, pag. 60. which he lays down to this sence: *We took, says he, Oyl of Tartar per deliquium and we poured it into Cows Milk, after which we added a small quantity of Spirit of Vitriol, and presently there arose an effervescence, and that of longer continuance, than if Milk had not been added. Which differency seems to depend upon the visciduity of the Milk: this effervescence will not proceed so well, if you put the Spirit of Vitriol into the Milk before you put in the Oyl of Tartar, (to wit,) because of its aptness to be coagulated by the Acid.*

Observations of Attenuation, and of
Coagulation.

1. We call *Attenuation*, when a *solid* and *Gross Body*, is rendred *thin* and *fluid*: but the contrary to this is called to *inspissat*, thicken, or *coagulate*, when such things which of themselves are *fluid*, and *thin*, acquire *firmness* and *subsistence*, and are *thickned*, either by the means of *Coagulation*, or *Gla- ciefcency*, (that is, *frozen* or made *Ice*) or else altogether *Lapidificated*, or turned into *Stone*; which *Physical*, or natural affections above all others are most frequently known not only in the *Apothecaries Shops*, but also in other *Mechanical Arts*: wherefore the whole *Spagirical Art* is by many believed to receive its name from *dissolving* and *congregating*, or *compacting* together, for which reason these two qualities (in our opinion) justly deserve a peculiar consideration.

2. When the *Apothecary* prepares *Decoctions*, or *Infusions*, and the *Cook* makes *fresh Broth*, by pouring on of *Liquids*: *gross* and *dense* bodies are *attenuated*, and their nobler parts extracted. There is the like reason in *Juleps*, or *emulsions*, and
the

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the rest of Medicines in a Liquid form.

3. Thus we see the bodies of all dry *Salts*, are melted and *attenuated*, by effusing watry Liquors upon them: From whence those *Solutions* called the *simple ones*, of which sort for *Example* is that of *Vitriol* dissolved into *Fountain Water*, which being mixed with the infusion of *Galls* produceth *Ink*, of which mention is made above in *chap. 2.*

4. Relating to this purpose are all the *corrosive Solutions* made by *Caustick Waters*, upon the solid *compage* of *Metals*. For *Gold* by its smallest parts doth swim in *Aqua Regia*, so that, that which is left to it self stops the sharpest sight: from looking into, it presently changeth its *Species*, and *Texture*, and appears *diaphanous*, or transparent.

5. Nor is it less to be wondred at, that the same *Gold*, and the rest of the *Metals* will suffer themselves to be so *attenuated* by the *Fire*, (by as it were a certain *corrosion*) that they will flow like *Waves* of *Water*: which *fusion* truly, unless the thing were so common as it is, would hardly be believed by such as were ignorant of it.

6. Al-

6. *Alabaster*, and *Gypsum*, or *Plaster of Paris*, may be burned as they do *Limestone*, as is commonly known; and it is particularly asserted by *Anselmus Boetius*, lib. 2. de *Lapid & Gemm. cap. 269*. But whether or no the following *Experiment* be much noted, I know not, (and therefore will set it down) Cast into a vessel of *Brass*, or *Iron* with a Flat botom, *Alabaster*, or in stead of it *Plaster of Paris*, (very finely grow'n'd, and sifted) some pounds weight : Apply *Fire* to it by degrees, even to the utmost height. And you shall see this *Stony Powder* to put on the form of a *Liquor*, and to boyl like *Waves*, sending up *White Vapours*, resembling *Smoak*; moreover if you then stir it with a *Stick*, you will not find it to resist the motion of your hand, like *Sand*, but to yeild like *Liquor* : which thing truly doth produce no small delight, to the curious *Spectator*, as *Mr. Boyl* doth witness of himself, in his *History of Fluidity*, Sect. 18. where he addeth more notes, and cautions upon this thing.

7. It is also ἀτρυχέσις, of a species of attenuation, by which *Salt of Tartar* is dissolved into a *Liquor per deliquium*: And amongst *Natures works*, it is an *Illustrious Attenu-*

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Attenuation, by which the thickest *Ice* of *Rivers* in the *Spring* time is dissolved by the heat of the *Sun*.

8. But that we may also come to the *Phænomena* or appearances of *Coagulation*, amongst those which are best known is that of making *Bread*, whilst the *Bakers* by mixing *Water* with *Flower* or *Meal* coagulate it into a *Mass*, to make *Bread* out of. The like, but more compounded work, is that of the *Confectioner*, who mixeth together *Butter*, *Sugar*, *Egs*, and divers other ingredients.

9. But there is hardly extant a more domestick, or familiar *Example*, than the coagulation of *Milk*, whether it be performed by *Calves*, or *Lambs Runnit*, or by juice of *Lemons*, or by *sowre Herbs*, *Spirit of Vitriol*, or other acid *Salt*: by which means the fluid substance of the *Milk* separates it self from the *whey*, and suddenly joyns together into a *cheesy Mass*.

10. In the *Canary Islands* they thicken, (by boyling) the fluid juice of *Canes and Reeds* into innumerably useful, and most sweet *Sugar*: And on the contrary, in the *Island of Succotra*, they make *Aloes* of the juice of a *Plant*, which is so exceeding bitter that it is become a nickname,

name, for other bitter things: [*You will have a large account of coagulations of this nature in the Philosophical Essay of Petrification, written by the Translator of this Treatise, and printed Anno 1672.*] Nay without Art, or Labour, *Water* is converted into *Stone* in divers dens. And to omit other Countrys, the *Cave* called *Baumanus's Cave*, not far from the *Mountain Bructer* in the great *Forest of Hircinia* in *Germany*, in which not only *Waters* are turned into stony *Icicles*, but also there is found a wonderful company of the *Bones of Animals*, but from what *Original*, or how they came there, is yet uncertain.

Eleventhly. But as to what concerns *Minerals*. If you mix the best *Urinous Spirit of Sal Armoniack* equal parts, with the most dephlegm'd *Spirit of Wine*, they will set, or fall to the bottom of the *Glass* in the manner of *Icy flakes*, or rather like *Snow*. For whilst the *Acrimony* of the *Armoniack Spirit* is blunted and mitigated, by the sweetness of the *Spirit of Wine*, the crisped, and sharp pointed *Particles* of the *Salt* falling to the bottom, and others falling still upon them, they represent the form of *Snow*.

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Twelfthly,

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Twelfthly, If *Spirit of common Salt* be mixed with the *Acid Spirit of Sal Armoniack*, (not with the *Salt Urinous* one) then at first the mixture will grow *hot*, and presently it will be *troubled*, and *thick*, and at length it will begin to conjoyn together plainly in the form of *Butter*.

Thirteenthly, If there be mixed together equal parts of highly rectified *Spirit of Wine*, and exquisitely *dephlegm'd Spirit of Urine*, they will coagulate (by agitating them) in a quarter of an hours time: first, into the form of *Snow*, and a little after, into a *solid Mass*. But unless both the *Spirits* be freed from all *Phlegm*, this business will want success: As *Mr. Boyl* doth prudently admonish in his *History of Fluidity and Firmness*, Part 2. Sect. 32.

Fourteenthly, Beat the *white of an Egg*, even to *thinness*, then mix with it half as much of the best *Spirit of Salt*: and you shall see this mixture will coagulate, even in a few Minutes of an hour by agitating it.

Fifteenthly, Many have attempted divers ways to coagulate the most Fluid Body of *Quicksilver*. *Jo. Rhénanus Dissert. Chymic. Part 1. Pag. 35.* proposeth his way. And that I may omit others, *Thomas Kes-*

lerus

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lerius now hath propounded his, *Cent. 1. Num. 79.* But the most exquisite, and no less certain way, is by the *vapour of Lead*; if you make a hole with a *Stick* in melted *Lead*, being removed from the *Fire*, and beginning to cool, then sprinkle some *Ashes* into the *Hole*, and nimbly pour in the *Quicksilver*: and so the *Vapour* ascending from the *Lead* will congeal it, although there are not wanting those which doubt of this *coagulation*. But the *Translator* of this *Treatise* hath experimented it to be true.

Sixteenthly, 'Tis a more difficult operation which I make use of to procure a yellow coagulated *Mercury*: for I take of *Quicksilver* one ounce, of *rust of Brass*, and common *Salt*, of each an ounce and a half, *Wine, Vinegar* a pound or pint: boyl them in an *Iron frying-Pan* the space of an hour or two, continually stirring them with an *Iron Spatula*, till at length the *Mercury* coagulate into an *Amalgame*, which afterwards wash several times from the *Salt*, and then form it into little *Balls*, the bigness of *Pease*. These little *Balls* being exposed to a temperate *Air*, after a few hours, will harden of their own accord: But if you have a mind also to induce a colour upon this coagulated *Mercury*, then

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take of *Turmerick roots* fourteen *Drams*, and of prepar'd *Tutia* one ounce, and mixing them together, make with the *Balls Stratum super Stratum*, that is, one row of the *Powders*, and another of the *Balls*, and so do till you have filled up a *Crucible*, which lute well, that nothing may expire. Let it stand at first in a *gentle fire*, that the matter may dry: afterwards for an *hour* or more, apply a *strong fire* to it; then take it off, and after it is *cold*, melt it as they use to do *Metals*, and pour it into an *Ingot*, and you will have a *Mass* very much resembling *Rhenish Gold*, of which may be made *Rings*, *Bracelets* and *Medals*. If there be any body that will not allow this *Mass* any longer to participate of the *Quicksilver*, I will not contest with him; because others which are acquainted with that *Planet*, will not be induced easily to believe, that it can freely endure a vehement fire for an hour together.

Observations upon Blood, and its Serum.

How much the *Blood within* is altered, by *attenuating*, or *coagulating* it, by means of *Mineral Spirits injected* into the *Veins*

of

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of *Brutes*, hath long since been declared by us, in *Clysmatica Nova*, cap. 5.

But, moreover, we have tryed many things upon *Humane blood* whilst it was yet *warm*, and newly drawn out of the *Veins* by *Phlebotomy*: observing that by instilling those *Mineral Spirits*, the *Blood* hath undergone various mutations: of which kind are *Ebullitions*, (or boyling, and bubling,) *Attenuation*, (or becomining thinner,) *grumesce*, curdling or coagulation, and the *exaltation* or heightning of its colour, or the *obscurat*ion, darkning or hiding of it, and many the like variations. But before *Humane blood*, let out by opening a *Vein*, do lose its *heat*, and begin to thicken, there useth to swim upon it a *Liquor*, heretofore taken for *Bile*, or *Choler*, now esteemed its *Serum*, or *Whey*. Certainly it is not so bitter that it can deserve the name of *Gall*, or *Choler*: neither is it so *thin* that it altogether deserves to be called *Whey*, or *Serum*. If it be taken up gently in a *Silver Spoon*, and without the mixture of the bloody substance, if it be held a little while over warm *Embers* or *Coals*, it will be *coagulated* like to the *white of an Egg* boyl'd, both as to its *substance* and *colour*,

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and is also almost like it in *taste*. As to what concerns its *colour*, I have taken notice of this difference; that in many it is perfectly *white*, in others it is *palish*, in others it tendeth towards *yellowness*: which variety may depend either from the *temperament*, or from the *healthy*, and *infirm state* of the *Body*, or from those things which are received into the *Body*, (for it appeareth that some portion of the *Chyle* is not changed altogether into *Blood*.)

If you put in of the aforesaid *Mineral Spirits* by *drops* upon this *Chylous Serum* put into several *Vessels*, there will also appear various *Phænomena*, which will be useful for a careful *Physician* to take notice of. In these kind of examinations, our very much honour'd *Collegiate*, that excellent man *Dr. Godfredus Leisnerus*, when he was living, did lately take much pains, who himself writ these following *Observations*, and a little before he yielded to *Fate*, communicated them to me to be divulged in this place.

Observation I.

Mr. N. N. by birth of *Clive*, of thirty
years

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years of age, he was *Scorbutick*, had red *Spots*, and *Pustils* in his *Face*, a heaviness and weariness in his *Joints*, and a *numness*, a flushing in his *Face* after drinking strong *Wine*, or strong *Beer*, or the *Swalbasher Spaw Water*, and was obnoxious to bleeding *Gums*, and the like; after having taken *Pills* upon the 28 day of *July*, 1671. He was let *Blood* in the left *Arm*, and had about seven *Ounces* taken from him, in three *Porringers*. The *Blood* was very hot in its flowing forth: the day before he had drank *Wine* largely, after which he was cold, his *Blood* had much *Serum*, and the *grumous* and curdled parts were very red, and would easily be divided by a *Twig*; in the bottom it was of a bright *Bay* colour, the *Serum* poured off, was of the colour of *Lee*, like *Urine* of a *Citron* colour tending to red: It was divided into twelve *Dishes*, and the *Liquors* being mixed with it, things appeared thus.

First, With *Spirit of Nitre* dropt on it, it presently coagulated into a substance like *Cheese*, from the top to the bottom of the *Liquor*, in that space the *Spirit* was dropt into: This *Curd* was white on the top, but towards the bottom yellow like *Sulphur*, the rest of the *Serum* swimming about

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it was clear, but dropping in *Spirit of Nitre* it also became of a *Cheesy substance*; some of the *Liquor* which remained, poured out clear like Water, upon inclining of the Vessel.

Secondly, The *sweet Spirit of Nitre* being drop'd on, made no alteration; but after a short time, the upper half of the *Liquor* grew altogether clear, but the lower half was a little troubled, yet so, that there could scarce any difference be discerned but by *curious Chymical eyes*.

Thirdly, *Spirit of Salt* did presently pervade the *Liquor*, not only in that place where it was drop'd in, but through the whole circumference of the *Liquor*, and about the bottom precipitated a *white coagulum*, but not stiff.

Fourthly, The *sweet Spirit of Salt* did trouble the *Liquor* a little, but in a short time there was a separation made like the *cream of Milk*, which swam at the top.

Fifthly, *Spirit of Vitriol*, did precipitate a *White Curd* equally from all parts to the bottom, almost *Analogous* to the *curd* made with the *sweet Spirit of Salt*, but thinner.

Sixthly, *Aqua-fortis* did altogether agree with the *Spirit of Nitre*, both in the *whiteness* of the *Curd*, its *yellowish bottom*,
and

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and the clearness of the Liquor which was left uncoagulated.

Seventhly, Spirit of Sulphur, converted the whole Liquor into a *white coagulum*, or Curd, except a few drops which were left.

Eightly, The Clyffus (or the *Sulphureous acid Spirit of Antimony*) being dropped in, precipitated to the bottom of the Liquor a Curd, which was on one side *White*, and *Cheesy*, and on the other side transparent, and like a *Jelly*.

Ninthly, Arcanum Nitri (that is the Solution of the Salt of the *caput Mortuum* of *Aqua-fortis*, or its red Earth left in the bottom of the Retort) dropped in, at the beginning it did presently fall to the bottom of the Liquor in which it was put: nor would it be mixed with it, so that it might be very well discerned from it, but after an hour or two, the Liquor was of an *higher Colour*, and there settled in the bottom of the Vessel a troubled Sediment, which upon slightly shaking of the Glass united again with the Liquor.

Tenthly, The Salt Spirit of Sal Armoniack did introduce no alteration at all in the Liquor, neither in its Colour, nor in its consistence.

Eleventhly,

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Eleventhly, The fixed Liquor of Nitre, did thicken and trouble this Liquor, and precipitated to the bottom a certain Sal-tish Curd, the Liquor which swam at the top was very clear.

Observation 2.

A Young man who was descended of consumptive Parents, and was himself consumptive, (with much coughing casting out both Blood, and Matters,) a Vein being opened there was taken from him about eight Ounces of Blood. The grumous Blood was of a florid Colour, Thin, and had much Serum, which being poured out into little dishes, it brought off with it from the top of the Blood a little redness, this subsided and fell to the bottom in a days time.

1. Spirit of Nitre, And

2. Sweet Spirit of Nitre, both produced the same effects, as in the former Observation.

3. Spirit of Salt did the same, but with this difference, that the Coagulum was more Pblegmatick on the top of it, and as it were a Jelly.

4. The

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4. The *Sweet Spirit of Salt*, did the same as in the former *Observation*, but the *Cream* was thicker.

5. *Spirit of Vitriol*, And

6. *Aqua-fortis*, did the same as in the former *Observation*.

7. *Spirit of Sulphur* made a *Coagulum* like *Spirit of Salt*, but a little thinner, and more like *Felley*.

8. The *Clyffus* made a white and thick *Curd*.

9. *Arcanum Nitri*. And

10. The *Salt Spirit of Sal Armoniack*. And

11. The *Liquor of fixed Nitre*, did the same as in the former *Observation*.

12. *Spirit of Verdigre*, at the first dropping into the *Glass* did make the clear *Liquor* to look *Milky*, and afterwards did make no further change.

Observation 3.

Mr. N. N. *Splenetick*, and *Scorbutick*, afflicted with a *Vertigo*, or *Giddiness*, and a straitness in his *Breast*, upon the 27th day of *July*, Anno 1672, was let blood, the *Blood* was good, and had much tinged
Serum

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Serum, into which the following things were dropped.

1. *Aqua-fortis*, from which there was a cheesy and white concretion, the *Serum* which swam at the top was pale; this *Coagulum* was not dissolved, by dropping into it Spirit of *Sal Armoniack*.

2. By the *Clyffus* there was made a white *Curd*, which fell to the bottom, but was less tenacious, or tough.

3. Spirit of *Nitre*, made a *Coagulum* like *Aqua-fortis* in all things, and when more Spirit was put in, the *Serum* was almost all coagulated.

4. Sweet Spirit of *Nitre*, made no alteration at all.

5. Spirit of *Salt* did equally precipitate a white *Curd* to the bottom, like a *Jelly*, and of a pale Yellow Colour at the top, leaving a Liquor that was somewhat paler above it.

6. Spirit of *Vitriol*, did absolutely the same thing, excepting that the Liquor which swam at the top, did remain somewhat more tinged.

7. Spirit of *Verdigrease* made no change at all.

8. The Spirit of *Sulphur* made the same *Coagulum* with Spirit of *Vitriol*.

9. *Polemanus's double Spirit*, did the same with

with Spirit of Salt, excepting that the Coagulum was a little thicker, and less white.

10. *Arcanum Nitri*, made a troubled bottom, but the *Glass* with the *Liquor* being shook it was exactly mixed again, and no alteration appeared. Into this mixture there being dropped one or two drops of *Aqua-fortis*, it produced a milkie curd after the usual manner.

11. The *Liquor* of fixed *Nitre* also made a troubled bottom, and shaking the glass it was exactly mixed again, but dropping in *Aqua-fortis* there was an ebullition made, and much *Spume*, or Froth raised of a *Sulphureous* colour, but nevertheless nothing was precipitated.

12. *Spirit of Sal Armoniack* prepared with the *Bloodstone*, did not thicken the *Liquor*, but only a little heighten the Colour, a drop or two of *Aqua-fortis* being added to this, presently made a milky curd: but a greater quantity of *Spirit of Sal Armoniack* being poured upon it, it was again dissolved with small bubbles, and instead of the Coagulum there remained as it were a little thin transparent *Phlegm*.

Observation 4.

These were instituted not in the *Serum*, but in the clotted *blood* it self. To wit Mr. N. N. after he had spit blood for some years, fell into a spitting of Matter, with an inordinate or irregular Feaver, after exhibiting of Medicines, and chiefly of *Adstringents*, the thirtieth day of *May* he fell into a large *Hæmoptisis*, or spitting of blood, he having been afflicted before it with a weightiness, and weariness of his Joynts: upon the first of *August* this *Symptome* was urgent again, and he cast up much florid *blood*, which was easily coagulated. The 2^d day of *August* after Midnight, his spitting of *blood* was very urgent, only he perceived his *blood* which he threw up to be hotter whilst it was in his *mouth*: it was neither *putrid* matter, nor *Salt* as heretofore. I commanded to take about four ounces of *Blood*, by opening a Vein in the *Right Arm*. The *Blood* which was let out was taken in two *Silver Dishes*, and appeared black even whilst it was flowing forth: it had little *Serum*, scarce two *drams*, and that of a *Yellow Colour*. The clotted blood had a florid red circle about it, the
middle

middle part was like the skin of a Jelly. To this *blood*, being well dryed with spongy Brown Paper, these following things were applyed.

1. One drop of *Spirit of Nitre*, did presently and sooner than in the twinkling of an Eye, impress a white spot upon it, and that not superficially, but sufficiently deep, and very white.

2. The *Sweet Spirit of Nitre*, made no change at all.

3. *Spirit of Salt*, did more slowly make a spot, and that less white, and less deep. The red Circle of the *blood* it self, and the circumference of the drop, were both black.

4. *Sweet Spirit of Salt*, at the first did nothing, but after it had stood sometime upon the *Liquor* it did a little dissolve the outward skin of the *Blood*, and made a hole in it, and rendred the blood under it, (in which it was contained) of a *livid flesh Colour*, spotted like Marble.

5. *Spirit of Vitriol* did slowly make a spot a little *whitish*.

6. *Aqua-fortis* did swiftly and immediately (with some Fume) make a spot altogether agreeable with that of *Spirit of Nitre*.

7. *Spirit*

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7. *Spirit of Sulphur*, made a Spot like that of *Spirit of Vitriol*.

8. The *Clyffus* produced a white spot.

9. *Spirit of Verdigre* as to its effect agreed with the *Sweet Spirit of Salt*.

10. *Arcanum Nitri* stood upon the Blood in its own circumference, afterwards it made a yellowish spot, and rendered the *skin* of the Blood thinner, so that it might easily be divided by a twig.

11. *Spirit of Sal Armoniack* made no change, or spot.

12. The *Liquor of Fixed Nitre* rendered the *Blood* much *Redder* and transparent.

FINIS.

Of the Grun-Walden- sin-Stone.

An Addition to the second Chapter.

*Concerning this the most Noble, and
Excellent Doctor, Christianus
Menzelius, Councillor and chief
Physitian to the most Serene the E-
lector of Brandenburg, hath not
only made Egregious and Worthy
Experiments: But hath also whilst
this Book was under the Press, sent
them to me in a Letter. And be-
cause they make much towards the
illustrations of the second Chap-
ter of this our Curious Distilla-
tory, we thought fit to subjoyn them
by way of Addition.*

H

Noble

Noble and most Experient Sir,
 my Collegiate, and most
 Honoured Friend.

YOU demanding that I would cast
 in some of my Chymical Obser-
 vations, to be added to your curious
 Distillatory, (by reason of the great
 Friendship which hath been betwixt us
 from our Youth,) I could not deny it:
 although I always desired, and had ra-
 ther have lain hid, than to have ven-
 tured writing either upon my own ac-
 cord, or with others. But omitting
 an infinite Number which seem to
 look towards your second chapter, I
 will therefore communicate only one
 Observation of my Chymical labours,
 about a certain Stone, which from the
 place of its growth, I call the Grun-
 Walden Stone. It was found here
 hard by Berlin, by myself, and Rhe-
 wend the Goldsmith (who is yet li-
 ving)

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ving) Anno. 1663. in the Month of May, near the Wood commonly called Der Brunwald, by the help of a Shepherds Boy, who knew the place, and shewed it to us. This Stone contains of Metals, Iron, and Copper: and of Metalline Juices, Sulphur, and Vitriol, which are hid in a Golden Markasite, with which this Stone abounds. This Markasite therefore (which the Greeks calls Pyrites) I separated from the rest of the Stone, and having reduced it into Powder, dissolved as much of it as I could in Aqua-fortis. I put the Solution in Sand to evaporate, and there remained in the bottom a matter that was fine, spongy, and of a yellowish Sulphur Colour. Upon several parts of this matter I poured,

1. Some Spirit of Wine, that I might dissolve, and digest it: and behold all became immediately exceeding Black.

H 2

2. Upon

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2. Upon another part of this Matter, I dropt Oyl, or Liquor of Tartar in some quantity, and presently there was a crackling noise, and ebullition, and there was induced upon it a bay Colour, but thick, and obscure.

3. This Liquor being Philtred, I mixed the Acid Spirit of Sulphur with it, and there emerged a most lovely Scarlet blood Colour, splendid like a Ruby, and transparent, there remaining in the bottom a gross, and black Sediment.

4. To this Ruby-coloured Liquor I added some drops of a Solution of Silver made with Aqua-fortis, and sooner than you can speak it, the Solution of Silver was coagulated upon the Liquor, into a Curd as white as Snow, and was like Fat, or the white of an Egg boyl'd hard, which after a little time fell down white to the bottom like Lime; the Liquor retaining its Scarlet blood Colour.

5. After

5. After I had abstracted this lovely Ruby coloured Liquor almost to dryness, there remained in the bottom a snowy Salt, Lanceolated or Chrystallized like Nitre. I poured upon these Chrystals clear Spring Water, and they were most easily dissolved in it, and the Liquor was clear, Limpid, and Transparent even like fair Water. But when I added to it the Oyl or Liquor of common Tartar, immediately the former Scarlet blood-Colour returned again.

6. I have a Liquor of Tartar digested with an Hungarian Gold Mineral; of this Oyl, or Liquor, when I put in a few drops, the whole Liquor became a blewish green Colour.

7. I took again also of the aforesaid Scarlet Blood-Colour'd Liquor one ounce or thereabouts, and to it added onely one drop of the Solution of Gold,

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made with Aqua Regis: & in less then a moment the whole Liquor of this lovely Red Sanguine Colour, was changed into a Goldish Yellow Colour, such as the Solution of the Gold was like that Kingly Star the Sun, discussing the Clouds, and filling all things with his commanding light.

Moreover, I here omit many more Chymical Phaenomena, wrought upon this Stone, which have slipped out of my mind: as also a Menstruum which turned that blood-coloured Liquor presently into clear, and Diaphanous Water; and another Menstruum, which turned the same Liquor into a Violet Colour; and others which transform'd it into other Colours. I yet keep by me a Sky-coloured Powder prepared of this Stone, which in its fairness is not exceeded by the Mountain Blew, or Sky colour, called Bergblau. For I confess there

there are no kind of true Colours which Painters do make use of, which do not in my opinion result from the Calxs of Metals or Minerals variously prepared. I send together with these a piece of this Grun-walden-Stone, that so if you please you your self may experiment the before recited Phænomena. I have also sent a portion of the wonderful Violet coloured Powder, so called by Geber the Arabian in his Summa Perfectionis. Cap. 28. lib. 1. Which I obtained from Copper calcin'd with Sulphur, about three days since. By way of Conclusion I add, an Experiment which happened to me concerning that Bilious Liquor, contained in the bladder of Gall: In this (above twenty years since,) I dissolved some Aloes Rosatum, or depurated Aloes, and the Green Colour of the Bile, or Choler was changed into a true blood Colour. The consideration of which

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thing, cannot I suppose but be beneficial
to all Men, Farewell.

Written in hast From my Study,
this 8th of March, 1674.

Your Excellencies

in all studious Observance.

Christianus Menzelus.

A N

A N

Addition to the fourth
Chapter concerning
a Diuretical Tin-
cture, commonly cal-
led the *Solar Tincture*.

As also a singular Experiment
concerning *Tyles*; proposed in
a Letter to me by the Noble
and Excellent Doctor *Casper
Marchius*.

Most Noble and Experienced Sir,
My Friend and Favourer, much
to be Honoured.

After that a little while since,
(according to the singular civili-
ty with which you abound,) you permit-
ted

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ted me to read your Curious Distillatory, (which now sweats under the Press;) I began to think, if I could not remember of my Chymical Labours, an Experiment or two, which might have some relation to the things you treat of: And behold there came Two into my mind, perhaps as well known to your self; but not alledged in that Elegant Writing of yours, if I remember rightly: in both of them there comes a Golden Colour over the Alimbeck, in one of them in the form of a Spirituous Liquor, in the other of them inhering in the form of a Salt, sufficiently Volatile; You know, worthy Sir, how from the Mineral of Hungarian Antimony, Nitre, Tartar, and the like, (chiefly such sorts of them as are thought to be Auriferous, or to containe Gold, adding according to the opinion of some men, Sal Armoniack also,) being well mixed together

ther, and cast into a certain instrument, by the help of an open Fire, there is drawn that sufficiently celebrated Liquor against the Stone, by many highly commended also against divers obstructions, and impurities of the Blood; which that it shines in its first distillation with a Golden Colour will hardly procure admiration to any one, since it is a true Solution of the Salt and Sulphur, expelled from these different Matters by the violence of the Fire; as also no man wonders that Spirit of common Salt is indued almost with the same Colour; but if it be rectified by a Retort, with a moderate Fire, it will be discovered how much Corporeal Salt it contained; and this rectified Spirit of Salt, will be almost Diaphanous, and without Colour. But concerning our almost Goldish Colour, I have often taken notice that being rectified more than once yet it brings over
with

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with it self the goldish Tincture, although it be not quite so deep as before : which is a sign that the Salt and Sulphur, are more intimately united, and under a Volatile Salt.

The Other Observation which I offer, is not so commonly known, nor have I happened to read of it in the writings of Chymists : every body knows that baked or burnt Tiles are of a reddish colour throughout, which Colour should any man have told me heretofore, that it were separable from them, I should have given as much credit to it, as to those who contend that the Tincture, or red Colour may be separated from Corals ; which as to the Colour, as it is a Naked quality, I hold to be impossible ; but in respect of some certain proportion of substantial matter (which I acknowledg to be

be the chief Subject of this Colour) which may be taken out of the Corals, by certain Menstruums, to account that thing impossible is neither well nor true. It happned (as I have known by experience) that the rusty, or rather red Colour with which the Tyles are tinged throughout, may be so separated from them, that nothing of it will be left, or remain in them. I was about to prepare the Volatile Urinous Spirit of Sal Armoniack, and therefore took, as the custom is, a Lixivate Alcaly in the preparation of it, by which means I obtained a pound or two of Salt, composed of both of them, to wit, the Alcaly, and the Sal Armoniack; from which being desirous to draw a Spirit, I did, after the most usual Method mix it with three times its weight of Powder of Tyles, and attempted to drive over the Spirit by a Retort, in a naked Fire, but I did not
obtain

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obtain what I would have had: for there distilled but very little Liquor, but at length there arose a Corporeal and Volatile Salt, in such proportion, that it almost filled up the Neck of the Retort, for which cause it would at last break it of necessity; The Retort therefore being taken out of the Fire, I observed all the Salt to be sublimed into the Neck and the upper part of the Retort, and it was Tincted with a Saffron Colour, and the Powder of the Tiles which was left, was deprived of all its Colour, and was like Ashes. Which extracting of the Colour by an Alimbeck from a body which had indured so great a stress of Fire before, As it is an Experiment worthy consideration: So I believe, Noble Sir, it will not be ungrateful, if it be added to your Experiments. Farewell. And as you have hitherto excellently done, Study the
publick

The curious Distillatory. III

*publick Good, and advancement
of Learning, and continue to Love
me,*

Yours

Berlin
10th of
March,
Anno.
1674.

*Ready upon all Friendly
occasions,*

CASPER MARCHIUS,
Doctor, Counsellor,
and chief Physitian
to the Elector.

E N D.

The citizens of Philadelphia. 111

Public Good, and advancement
of Learning, and culture in Letters

John

Ready upon all friendly

occasions, and

CASPER MARCH 18

Doctor, Counsellor,

and chief Physician

to the Elector.

Berlin

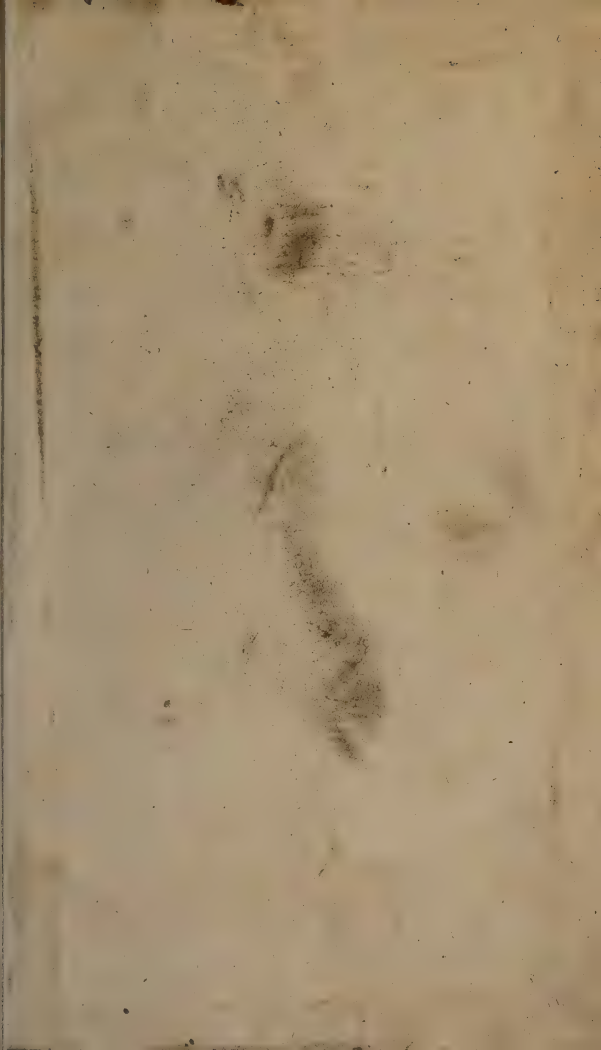
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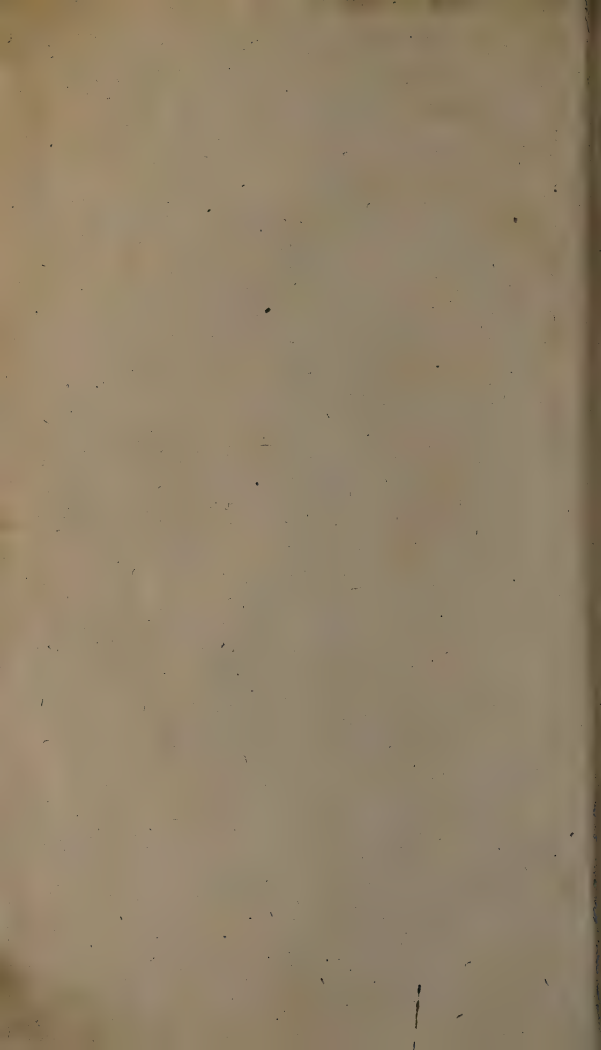
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E. W. D.





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